IMPACT AND EFFECTIVENESS
TABLE 27

School Food & Beverage Policies

EFFECTIVENESS TABLES

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
School Meal Policies - United States				
Author Perry, Bishop (2004) Minnesota **Design** Intervention Evaluation Group randomized trial **Duration** High 2 years	**Measures** *Access to healthy food options* (additional serving of fruit and/ or vegetable in the lunch line and school snack cart, and verbal encouragement by food service staff) **Outcome(s) Affected** Fruit and vegetable consumption (direct observation)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Verbal encouragement by food service staff associated with; increased fruit and vegetable consumption (no potatoes, no juice) at follow-up (r^2=0.40; regression coefficient= 0.64, p=0.001), increased fruit and vegetable consumption (no potatoes) at follow-up (r^2= 0.26; regression coefficient= 0.52, p=0.007), increased fruit consumption (no juice) at follow-up (r^2= 0.24; regression coefficient= 0.49, p=0.011), and increased consumption of fruits and vegetables (no potatoes, no juice) from baseline to follow-up (regression coefficient= 0.34). 2. The number of fruits and vegetables on the snack cart was associated with increased fruit and vegetable consumption from baseline to follow-up (r^2= 0.45; regression coefficient= 0.53, p=0.001). ENVIRONMENT CHANGE: 3. Intervention schools had greater verbal encouragement from food service staff than control schools (42% of observations vs. 11% of observations, p=0.01) and more fruits and vegetables to choose from (mean= 4.37 vs. mean= 3.89, p<0.01).	**Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Lytle, Kubik (2006); Klein, Lytle (2008); Story, Lytle (2002); Birnbaum, Lytle (2002); Lytle, Murray (2004); Lytle, Gerlach (2001); Lytle, Perry (2001); Kubik, Lytle (2003) Minneapolis/St. Paul, MN TEENS study **Design** Intervention Evaluation Group randomized trial **Duration** High 3 years 1997-2000	**Measures** *Access to healthy food options* (increased offerings of fruits and vegetables and low fat snacks) **Outcome(s) Affected** Dietary consumption of fruits and vegetables (student survey, 24 hour recalls)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: *End of year 1:* 1. After year one, there was an increase of about one full serving daily in fruit and vegetable consumption for peer leaders (p<0.012). 2. After year one, there was a half of one serving daily increase in fruit and vegetable consumption in curriculum + environment change group (p=0.058). 3. After year one, there was an increase in usual food choice score (higher score equals lower fat consumption) among peer leaders (from 5.90 to 6.54, p=0.002) and students exposed to the curriculum and environment change (from 5.68 to 6.32, p<0.001) *End of year 2 (follow-up):* 4. The positive effect in F&V consumption seen after 1 year of intervention was not maintained at follow up. The only significant effect was seen for usual food choice score (non-validated instrument). A greater level of intervention exposure resulted in a statistically significant higher food choice score (omnibus test p= 0.01). ENVIRONMENT CHANGE: 5. The differences in healthier items offered in the a la carte line between the intervention and control schools was significant (p=0.04).	**Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect size = Net Positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Reynolds, Franklin (2000); Reynolds, Franklin (2000); Reynolds, Raczynski (1998); Harrington, Binkley (1997) Alabama **Design** Intervention Evaluation Group randomized trial **Duration** High 12-24 months	**Measures** *Access to healthy food options* (offering at least 10 F&V servings per week, modifying recipes to meet 5 A Day guidelines, offering salad bar or pre-plated salads) **Outcome(s) Affected** Fruit, vegetable and fat consumption (24hr dietary recall, parent questionnaire)	**Net Positive for Nutrition in Children (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. There was higher reported fruit and vegetable intake in intervention vs. control at follow-up 1 and follow-up 2 (follow-up 1= 3.96 vs. 2.28 servings, p<0.0001; follow-up 2= 3.20 vs. 2.21, p<0.0001). 2. There was higher reported fruit intake alone (follow-up 1= 1.71 vs. 0.83, p<0.0001; follow-up 2= 1.21 vs. 0.65, p<0.0001) and vegetable intake alone (follow-up 1= 1.84 vs. 1.15, p<0.0001; follow-up 2= 1.60 vs. 1.25, p<0.009) in the intervention vs. control group. 3. Intervention effects on fruit and vegetable consumption were not obtained in the cafeteria observations. 4. At follow-up 1 and 2, after adjusting for baseline levels, the intervention students had a smaller percentage of calories coming from total fat (follow-up 1= 30.93 vs. 33.37, p<0.003; follow-up 2= 31.56 vs. 33.23, p<0.0402) and saturated fat (follow-up 1= 11.07 vs. 12.00, p<0.009; follow-up 2= 11.49 vs. 12.24, p<0.0249) but had higher levels of calories coming from carbohydrates, fiber, folate, beta carotene and vitamin C (data not shown) compared to the control students. 5. There was a higher combined fruit and vegetable consumption in the intervention vs control group at follow-up 1 (4.23 vs. 3.94, p<0.0366). The only significant difference between conditions was for vegetable consumption (2.38 vs. 2.21, p<0.0359). ENVIRONMENT CHANGE: 6. In the intervention cafeteria at follow-up 1, a mean of 3.5 servings of fruits and vegetables were offered to students, a mean of 3.6 High 5 posters were exhibited, and a mean of 4.4 food labels were displayed.	**Effective for Nutrition in Children** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in children and net neutral for nutrition in parents	**Maintenance** Not Reported **Sampling / Representativeness** Low Students who were African American, participated in a free or reduced-cost lunch program, not on the AB Honor Roll, or frequently absent (x=7.5 days) were significantly less likely to participate in the study than students who were White, on the full-pay lunch program, on the AB Honor Roll and infrequently absent (x=5.5 days)- p<0.01.
Author Perry, Bishop (1998); Story, Mays (2000) Minnesota **Design** Intervention Evaluation Group randomized trial **Duration** High 12-24 months	**Measures** *Access to healthy food options* (increased nutrition education and provision of fruits and vegetables in school) **Outcome(s) Affected** Fruit, vegetable, fat, vitamin A and vitamin C consumption (direct observation and 24hr dietary recall)	**Net Positive for Nutrition for the Study Population (School Food and Beverage Policies)** **Net Positive for Nutrition in Girls (School Food and Beverage Policies)** **Net Neutral for Nutrition in Boys (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Observations showed that there was a higher intake of fruit and vegetable (F&V) (mean difference= 0.47 servings, p<0.0001) and fruit alone (mean difference= 0.30 servings, p<0.0001) in the intervention schools compared to the control schools. 2. Observations showed no difference between the intervention and control schools in percent of calories consumed from fat and saturated fat. 3. There was a significant intervention effect observed among girls for vegetable consumption at lunch (Δ= 0.26 servings, p<0.05) but not among boys (Δ= 0.04 servings). 4. Vitamin A and C intake were also found to be higher in intervention vs. control schools, due only to effects among girls (Δ= 13.73 mg, p<0.001). 5. Higher intake of F&V per 1000 kcal (mean difference= 0.41 servings, p=0.02), servings of fruit (mean difference= 0.62 servings, p=0.02), servings of fruit/per 1000 kcal (mean difference= 0.05 servings, p=0.02) and decrease in percentage of kcal from total fat (mean difference= -1.81, p=0.02) were reported in the intervention group. 6. There was a significant and favorable intervention effect reported among girls for vitamin C consumption (mean difference= 27.73, p=0.02), but no effect among boys. ENVIRONMENT CHANGE: 7. Intervention schools offered more F&V choices and F&V promotions compared to control schools.	**Effective for Nutrition in the Study Population** **Effective for Nutrition in Girls** **Not Effective for Nutrition in Boys** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in the Study Population and girls and net neutral for nutrition in boys	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Bartholomew, Jowers (2006) Texas **Design** Intervention Evaluation Group randomized trial **Duration** Medium 6-12 months	**Measures** *Access to healthy food options* (reduction of high fat food choices in schools) **Outcome(s) Affected** Dietary consumption of low-fat foods (sales data)	**Not Reported (for desired health outcomes)** **Net Positive for Food Choice in Lower-income, Hispanic Students (School Food and Beverage Policies)** **School Food and Beverage Policies** FOOD CHOICE: 1. No significant differences were seen in entrée selection during phase 1 between intervention and control schools. Low fat entrée selection was 15.4% in the intervention group vs. 11.3% in the control group (F=3.20 p=0.07), moderate fat entrée selection was 16.2% in the intervention group vs. 18.6% in the control group (F=0.11, p>0.10) and high fat entrée selection was 80.2% in the intervention group vs. 86.4% in the control group (F=2.74, p=0.10) 2. In phase 2, there was a significant difference seen in entrée selection between intervention and control schools. Low fat entrée selection was 32.1% intervention vs. 13.8% control (F=71.06 p<0.01), moderate fat entrée selection was 26.4% intervention vs. 7.5% control (F=34.77, p<0.01) and high fat entrée selection was 70.4% intervention vs. 86.9% control (F=67.22, p<0.01) ENVIRONMENT CHANGE: 3. Of the 207 intervention entrées observed during phase 1, 32.4% were low-fat, 19.8% were moderate-fat, and 47.8% were high-fat. In the control group 15% were low-fat, 22.2% were moderate-fat, and 62.8% were high-fat entrées. 4. In the intervention group 112 entrées were analyzed. Of the 112 intervention entrées analyzed during phase 2, 28.6% were low-fat, 21.4% were moderate-fat, and 50% were high-fat entrées. In the control group 26.5% were low-fat, 15.7% were moderate-fat, and 57.8% were high-fat entrées.	**More Evidence Needed** Study design = Intervention evaluation Intervention duration = Medium Effect size = Not reported	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Burgess-Champouxt, Chan (2007) Minnesota **Design** Intervention Evaluation Non-randomized trial **Duration** Low <6 months	**Measures** *Access to healthy food options* (replacing refined-grain products with whole-grain products in school cafeterias) **Outcome(s) Affected** Dietary consumption of whole grains (direct observation, questionnaire)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Consumption of whole grains increased by about 1 serving (p<0.0001) and refined-grains decreased by about 1 serving (p<0.001) for intervention vs. control children. 2. Compared to control schools, intervention schools had higher changes in dietary fiber (1.3g vs. -0.4g, p=0.001), riboflavin (0.03mg vs. -0.06mg, p=0.03), and iron (0.4mg vs. -0.4mg, p=0.04). There were no significant differences found for energy, thiamin, or folate. ENVIRONMENT CHANGE: 3. There was greater availability of whole-grain foods in student lunches in intervention vs. control schools: 1.05 mean serving increase vs. 0.09 mean serving increase (p<0.0001).	**Somewhat Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = Low Effect size = Net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Nucci, Stuhldreher (2003) West Virginia and Pennsylvania **Design** Intervention Evaluation Before and after study with a comparison group **Duration** High >2 years	**Measures** *Access to healthy food options* (implemenation of school nutrition policies to improve nutrition standards) **Outcome(s) Affected** Dietary consumption of cholesterol, sodium, calories, saturated fat, protein, iron, zinc, fiber, thiamin and calcium (24hr dietary recall, direct observations)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **Net Positive for Nutrition in Females (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Females in the WV after cohort consumed lower mean sodium (from 1245.3±527.4 mg to 812.0±392.0 mg, p<0.001). 2. Mean total fat reported as the percentage of calories, decreased in the WV after cohort (from 39.5±8.3% to 33.6±7.3%, p<0.001 males; and from 37.2±9.3% to 31.6±9.3%, p<0.05 females). 3. There were no differences in the percentage of calories from saturated fat between the two time periods. 4. Compared to the PA unexposed cohort, the WV after cohort had lower mean levels of protein (26.0±8.0g vs. 29.0±7.0g, p<0.01 males; 18.0±9.0g vs. 25.0±8.0g, p<0.01 females) and calories (547.0±164.0 vs. 662.0±122.0, p<0.001 males; 377.0±159.0 vs. 607.0±179.0, p<0.001 females). 5. There were noticeable decreases among the WV after cohort for iron, zinc and fiber, and among females for vitamin B6 and calcium (data not shown). 6. Higher mean values for thiamin, calcium, and iron were observed among the PA cohort compared to the WV after cohort. Mean zinc intakes were higher for the PA cohort among females (data not shown)	**Effective for Nutrition in the Study Population** **Effective for Nutrition in Females** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in the study population and females	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Slusser, Cumberland (2007) California **Design** Intervention Evaluation Before and after **Duration** High >24 months	**Measures** *Access to healthy food options* (introduction of a salad bar as a selection in the school lunch program) **Outcome(s) Affected** Dietary consumption of fruits and vegetables (24hr dietary recall)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Frequency of fruit and vegetable consumption increased between 1998 and 2000 (from a mean [SD] of 2.97 [2.0] to 4.09 [2.7], p<0.0001). 2. Frequency of fruit and vegetable consumption increased significantly in 2000, compared with 1998, when age and gender were analyzed separately (p<0.01 and p<0.0001, respectively; mean frequency not reported). 3. The increase in frequency of fruits and vegetables consumed was almost completely related (84%) to an increase during lunch. 4. Significantly lower mean daily intakes of energy (1607 kcal vs. 1804 kcal, p=0.03), cholesterol (202 mg vs. 251 mg, p=0.02), saturated fat (19 g vs. 26 g, p<0.0001) and mean percentage energy from fat intake (31% vs. 33%, p=0.03) in the children in the year 2000 sample compared with children in the year 1998 sample.	**Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Gleason, Suitor (2003) United States **Design** Association Cross-sectional study **Duration** Not Applicable Only cross-sectional data provided	**Measures** *Access to healthy food options* (access to healthy lunch options at school through the National School Lunch Program) **Outcome(s) Affected** Dietary consumption (1994-96 Continuing Survey of Food Intakes by Individuals [CSFII])	**Positive Association for Nutrition in the Study Population (School Food and Beverage Policies)** **(Assumption: Participating in the NSLP will provide greater access to healthy food options, which will lead to a greater consumption of healthy food in children)** **School Food and Beverage Policies** NUTRITION: *Ordinary Least Squares Model* 1. After controlling for demographic characteristics, National School Lunch Program (NSLP) participants consumed an average of 30% of the Recommended Energy Allowance (REA) at lunch, compared with 26% among nonparticipants ($p<0.01$). This difference persisted over the remainder of the day: the 24-hour food energy of participants (94% of the REA) exceeded that of nonparticipants (88%). 2. Participants' lunchtime intake of 11 nutrients was significantly higher than that of nonparticipants & most of the differences remained statistically significant over 24 hours, suggesting that dietary intakes of participants & nonparticipants were comparable at other meals (data not shown). 3. NSLP participants had significantly larger mean lunchtime and 24-hour intakes of sodium (lunch 1117 vs. 901 mg, $p<0.01$; 24 hour 3377 vs. 3065, $p<0.01$), cholesterol (lunch 67 vs. 46 mg, $p<0.01$; 24 hour 225 vs. 205 mg, $p<0.05$) and lunchtime fiber intake (4.8 vs. 4.0 g, $p<0.01$) than nonparticipants. 4. NSLP participants who ate school lunches consumed more fat and protein than nonparticipants. However, participants' consumption of carbohydrates--added sugars in particular--was lower than that of nonparticipants. Over 24 hours, participants consumed an average of 34% of calories from total fat and 13% from saturated fat; in contrast, nonparticipants consumed 32% and 12% of calories from total and saturated fat, respectively ($p<0.01$ for both). 5. Participants' regression adjusted mean intake of added sugars contributed 17% of their 24 hour food energy, compared with 20% for nonparticipants. Thus, even though NSLP participants' food energy intake was higher than that of nonparticipants, their mean absolute intake of added sugars was lower (22 versus 24 teaspoons). *Fixed Effects Model (controlled for selection bias, N=1614)* 6. Unlike the ordinary least squares results, the fixed effect results showed that NSLP participation was not significantly related to children's intakes of food energy, sodium and cholesterol. However, both models found that participation led to a significant increase in dietary fat intake and a significant decrease in children's intake of added sugars. 7. NSLP participation had a significant positive impact on the intake of 6 vitamins and minerals, both at lunchtime and over 24 hours (data not shown).	**Positive Association for Nutrition in the Study Population** Study design = Association Effect size = Positive association for nutrition in the study population	**Maintenance** Not Applicable **Sampling / Representativeness** High The 1994-96 Continuing Survey of Food Intakes by Individuals is a survey that comprises three independently drawn, nationally representative samples of the noninstitutionalized population of the United States.

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
School Meal Policies - International				
Author Haerens, Deforche (2006); Haerens, De Bourdeauduij (2007); Haerens, De Bourdeauduij (2006); Haerens, Cerin (2007); Haerens, Cerin (2007); Haerens, Deforche (2006) Belgium **Design** Intervention Evaluation Group randomized trial **Duration** High 2 school years	**Measures** *Increased access to healthy and affordable food and water, and a healthy school environment* (offering fruit for dessert, reducing price of fruites, vegetables, and water; pricing water cheaper than soft drinks; providing free drinking water through fountains; inclusion of physical activities in school environment) **Outcome(s) Affected** Overweight/obesity (height and weight to compute BMI), dietary consumption (food frequency questionnaire), physical activity (accelerometers, physical activity questionnaire)	**Net Positive for Overweight/obesity in the Study Population (School Food and Beverage Policies)** **Net Positive for Overweight/obesity in Girls (School Food and Beverage Policies)** **Net Neutral for Overweight/obesity in Boys (School Food and Beverage Policies)** **Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **Net Positive for Nutrition in Girls (School Food and Beverage Policies)** **Net Neutral for Nutrition in Boys (School Food and Beverage Policies)** **Net Positive for Physical Activity in the Study Population (School Food and Beverage Policies)** **Net Positive for Physical Activity in Girls (School Food and Beverage Policies)** **Net Neutral for Physical Activity in Boys (School Food and Beverage Policies)** **School Food and Beverage Policies** 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). 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. *(continued next page)*	**Effective for Overweight/ obesity in the Study Population** **Effective for Overweight/ obesity in Girls** **Not Effective for Overweight/ obesity in Boys** **Effective for Nutrition in the Study Population** **Effective for Nutrition in Girls** **Not Effective for Nutrition in Boys** **Effective for Physical Activity in the Study Population** **Effective for Physical Activity in Girls** **Not Effective for Physical Activity in Boys** Study design = Intervention evaluation Intervention duration = High Effect size= Net positive for overweight/ obesity, nutrition, and physical activity in the study population and in girls, net neutral for overweight/ obesity, nutrition, and physical activity in boys	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

(Continued from previous study)				
		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.		

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Bayer, von Kries (2009) Germany **Design** Intervention Evaluation Group randomized trial **Duration** High 12-24 months	**Measures** *Access to a healthy school environment* (time spent in VPA during school, dietary consumption) **Outcome(s) Affected** Fitness tests (parent questionnaire, motoric testing) and nutrition (questionnaire)	**Net Positive for Nutrition for Study Population (School Physical Activity Policies)** **School Food and Beverage Policies** NUTRITION 1. There was a significantly higher consumption of fruits in the first sample intervention group (66.6%, 95% CI: 63.3-69.8 vs 55.7%, 95% CI: 51.0-60.3; p<0.0001) and the second sample intervention group (66.7%, 95% CI: 63.4-69.9 vs 56.3%, 95% CI: 51.6-60.9; p=0.0002) compared to the control. 2. There was a significantly higher consumption of vegetables in the second sample intervention group (42.7%, 95% CI:39.4-46.1 vs. 33.6%, 95% CI: 29.2-38.1; p=0.0013) compared to the control. 3. There was a lower consumption of high caloric drinks while watching TV observed in the sample one intervention compared to the control (60.4%, 95% CI: 56.6-64.2 vs. 47.7%, 95% CI: 42.4-52.9; p<0.0001). In sample 2, the proportion of children with a low consumption of high caloric drinks increased in the intervention group; a greater increase in the control group rendered the difference between groups non-significant.	**Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Marcus, Nuberg (2009) Sweden **Design** Intervention Evaluation Group randomized trial **Duration** High August 2001 – June 2005	**Measures** *Access to a healthy school environment* (time spent in physical activity during core classes, dietary consumption) **Outcome(s) Affected** Overweight/obesity (height and weight [body mass index]), physical activity (accelerometer), and nutrition (questionnaire)	**Net Positive for Overweight/obesity in the Study Population (School Physical Activity Policies)** **Net Positive for Overweight/obesity in Boys (School Physical Activity Policies)** **Neutral for Overweight/obesity in Girls (School Physical Activity Policies)** **Net Positive for Nutrition for Study Population (School Physical Activity Policies)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. There was a significant difference between intervention and control groups with respect to prevalence of overweight & obese children in grades 2-4 and 3-4 from baseline to follow-up (difference= -6.0%, 95% CI: -10.6,-1.3%, p<0.05; difference=-9.2%, 95% CI: -16.9,-3.3, p<0.01, respectively). 2. For boys, the prevalence of overweight and obesity in the intervention schools was significantly reduced, whereas it increased in control schools from 2001-2005. The difference between the two groups was -7.7% (95% CI: -14.1,-1.2; p<0.05). No difference was found among girls. 3. There was an increase in the proportion of normal weight children in the intervention group, compared to the control group (2.3 vs 1.1%). The corresponding proportions of children who shifted from overweight or obese to normal weight were 14% and 7.5%, respectively (p=0.017). NUTRITION: 4. Intervention families with 3rd and 4th grade children reported healthier eating habits at home compared to controls with significant differences in consumption of high-fat dairy products (p=0.001), sweetened cereals (p=0.02), sweet products (p=0.002) [data not shown].	**Effective for Overweight/ obesity in the Study Population** **Effective for Overweight/ obesity in Boys** **Not Effective for Overweight/ obesity in Girls** **Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for overweight/ obesity in the study population and boys, neutral for overweight/ obesity for girls, and net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Sahota, Rudolf (2001); Sahota, Rudolf (2001) Leeds, United Kingdom **Design** Intervention Evaluation Group randomized trial (delayed intervention) **Duration** Medium September 1996 - July 1997	**Measures** *Access to a healthy school environment* (time spent in physical activity throughout the school day, dietary consumption) **Outcome(s) Affected** Overweight/obesity (height and weight), nutrition (24-hour food recall, 3-day food diary, observations, menu analysis) physical activity (questionnaires)	**Neutral for Overweight/obesity in the Study Population (School Physical Activity Policies)** **Net Positive for Nutrition in the Study Population (School Physical Activity Policies)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. No significant difference for overweight (weighted mean difference= -0.07, 95% CI: -0.22 to 0.08) or obese (weighted mean difference= -0.05, 95% CI: -0.22 to 0.11) between intervention and control children at follow-up. NUTRITION: 2. Intervention children had higher vegetable intakes than control children at follow-up (weighted mean difference= 0.3, 95% CI: 0.2 to 0.4) 3. Overweight intervention children had higher vegetable intakes than overweight control children at follow-up (mean difference= 0.3, 95% CI: 0.1 to 0.5), when comparing the 24-hour food recall. 4. Obese intervention children had higher vegetable intakes than obese control children at follow-up (mean difference = 0.3, 95% CI: -0.1 to 0.6) 5. Obese intervention children had lower fruit intakes than obese control children at follow-up (mean difference= -1.0, 95% CI: -1.8 to -0.2), when comparing 24 hour recall. 6. According to the 3-day food diaries, overweight intervention children had higher intakes of foods and drinks high in sugar than overweight control children (mean difference= 0.8, 95% CI: 0.1 to 1.6). No other differences in dietary consumption were found using the 3-day diaries.	**Not Effective for Overweight/ obesity in the Study Population** **Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = Medium Effect size = Neutral for overweight/ obesity in the study population and net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** High Sociodemographic measures suggested that the evaluation sample populations generally reflected the Leeds school aged population, although there was a slight bias towards more advantaged children.
Author Prell, Berg (2005) Sweden **Design** Intervention Evaluation Group randomized trial **Duration** Low <6 months	**Measures** *Access to healthy food options* (increased access to healthy fish in school lunches and education about fish preparation in home economics groups) **Outcome(s) Affected** Dietary consumption of fish (direct observation)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. The change in fish consumption in the school lunch + home economics group (RP = 0.15, CI=0.06-0.24) differed significantly from the control group (RP = -0.08, CI= -0.17-0.01) but not from School Lunch group (RP = 0.10, CI= -0.02 – 0.22). 2. In the School Lunch + Home Economics group, the proportion of fish eaters at baseline increased from 56% to 71% at follow up, in the School Lunch group there was an increase from 59% to 69% and in the control group there was a decrease from 77% to 69%.	**Somewhat Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = Low Effect size = Net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Ho, Gittelsohn (2008); Rosecrans, Gittelsohn (2008); Ho, Gittelsohn (2006) Canada **Design** Intervention Evaluation Non-randomized trial (delayed intervention) **Duration** Medium 9 months	**Measures** *Access to a healthy school environment* (time spent in physical activity throughout the school day, dietary consumption) **Outcome(s) Affected** Light, moderate and vigorous activity (accelerometer), overweight/obesity (height and weight [body mass index], and nutrition (questionnaire)	**Neutral for Overweight/obesity in Native Americans/Alaskan Natives (Study Population) (School Physical Activity Policies)** **Net Positive for Nutrition in Native Americans/Alaskan Natives (Study Population) (School Physical Activity Policies)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. After adjustment for baseline values and other covariates, there was no significant difference in change in BMI between intervention and comparison groups. 2. On average, intervention respondents gained 1.8 kg (range: -9.4, 37.5 kg) and comparison respondents gained 0.1 kg (range: -15.1, 14.4 kg). NUTRITION: 3. At follow-up, intervention respondents had significantly higher healthy food acquisition scores than comparison respondents after adjustment for baseline scores and other covariates (β=0.947, p=0.003; adjusted R^2= 0.4058). (Note: Results shown here are not limited to the school intervention, encompassing the community intervention as well [average age of those respondents ~40].)	**Not Effective for Overweight/obesity in Native Americans/Alaskan Natives (Study Population)** **Effective for Nutrition in Native Americans/Alaskan Natives (Study Population)** Study design = Intervention evaluation Intervention duration = Medium Effect size = Neutral for overweight/obesity and net positive for nutrition for Native Americans/Alaskan Natives	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Parker, Fox (2001) England **Design** Intervention Evaluation Non-randomized trial **Duration** High 12-24 months	**Measures** *Access to healthy food options* (increased access to fruits, vegetables, non-fried potatoes, high fiber bread and non-cream cakes in schools) **Outcome(s) Affected** Dietary consumption of fruits, vegetables and fiber (direct observation)	**Net Positive for Nutrition in Children (School Food and Beverage Policies)** **(Note: Schools 1 & 3 were intervention schools and School 2 was the control school.)** **School Food and Beverage Policies** NUTRITION: 1. A 50% increase (dietary target) in fruit consumption was achieved in School 1 during monitoring periods 2 & 3 (12.5 & 13.8 pupils respectively), but not sustained. 2. There was a dietary target for fruit consumption not attained at any point in School 3, with a significant decrease in fruit consumption at period 5 (p<0.01). 3. There was a 50% increase (dietary target) in vegetable and salad consumption during the final period in School 1, with 15.3 pupils (p<0.01); School 2 had a significant increase at period 2 with 10 pupils (p<0.001). It declined thereafter, although was still significantly higher at the end of the study (p<0.01). 4. In school 3 the high fiber bread dietary target (100% increase) was reached in period 1 (26.3% of pupils) and sustained for the duration of the study (p<0.05). 5. The proportion of high-fiber bread consumed in School 1 varied from 39.8% to 12.6% between periods 2 and 4, to 37.6% at the end of the study. 6. There was a decline in non-fried potato consumption to 2% (p<0.01) in School 1 at period 1, but the target (66% increase) was exceeded during period 3 with the proportion rising to 14.2% (coinciding with the launch of the filled jacket potato station). This level of consumption was not sustained but remained higher than at baseline. School 3 showed a change in the wrong direction from period 1 onwards, the proportion of only 1.1% becoming significant by period 5 (p<0.001). 7. School 3 achieved the target 50% increase for the consumption of non-cream cake during periods 2 and 3 with 59.4% (p<0.01) and 57.4%, respectively, but this was not sustained. School 1 showed a negative change up to period 3, with a marked rise to 45.3% by period 5 (not significant). ENVIRONMENT CHANGE: 8. Proportion of high fiber bread offering increased in School 1 from 18% of all bread to 36% (95% CI=12-37) and in School 3 from 10% to 28% (95% CI=7-34). A jacket potato bar was introduced as a fast food area for healthier options in School 1 and a salad "cart" was introduced in School 3.	**Effective for Nutrition in Children** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in children	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Ask, Hernes (2006) Norway **Design** Intervention Evaluation Group randomized trial **Duration** Low 4 months	**Measures** *Access to healthy food options* (increased availability of: low fat milk, orange juice, whole grain bread, different spreads with fish, meat and cheese and fruit through school-provided breakfast) **Outcome(s) Affected** Overweight/obesity (height and weight to compute Body Mass Index) and dietary consumption(food frequency questionnaire)	**Net Neutral for Overweight/obesity in the Study Population (School Food and Beverage Policies)** **Net Negative for Overweight/obesity for Boys in the Study Population (School Food and Beverage Policies)** **Net Neutral for Overweight/obesity for Girls in the Study Population (School Food and Beverage Policies)** **Net Neutral for Nutrition in the Study Population (School Food and Beverage Policies)** **Net Positive for Nutrition for Boys in the Study Population (School Food and Beverage Policies)** **Net Neutral for Nutrition for Girls in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. Post-intervention, weight and BMI increased significantly in control group males (from median 67kg to 70 kg for weight, $p<0.01$; and from median 21.7kg/m^2 to 22.4kg/m^2 for BMI, $p<0.05$) and in control group females (from median 59 kg to 61 kg for weight, $p<0.01$; and from median 21.6 kg/m^2 to 22.1 kg/m^2 for BMI, $p<0.05$) 2. There was also a significant increase in weight in the intervention group males from baseline to post-intervention (from median 73 kg [range= 55-109] to 73 kg [range= 57-111], $p<0.05$), but not in females. 3. BMI did not change significantly in the intervention group. NUTRITION: 4. Healthy eating index score increased in male intervention students (from median score of 69 to 85, $p<0.01$) but not for control males or girls in either group. 5. At baseline, 54% of intervention students and 43% of control students had breakfast every day. During the intervention period almost all students in the intervention group had daily breakfast at school, but this was not sustained one week post-intervention. 6. From pre-intervention to one week post-intervention, reported intake of lunch every day in the intervention group increased from 52 to 54% and from 81 to 86% in the control group. The increase in lunch frequency was statistically significant in the control group ($p<0.01$) post intervention, while there was a non-significant increase in the intervention group.	**Not Effective for Overweight/obesity in the Study Population** **Not Effective for Overweight/obesity in Boys** **Not Effective for Overweight/obesity in Girls** **Not Effective for Nutrition in the Study Population** **Somewhat Effective for Nutrition in Boys** **Not Effective for Nutrition in Girls** Study design = Intervention evaluation Intervention duration = Low Effect size = Net negative for overweight/obesity in boys, net neutral for overweight/obesity in the study population and girls and net positive for nutrition in boys and net neutral for nutrition in the study population and girls	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Shemilt, Mugford (2004); Shemilt, Harvy (2004) England **Design** Intervention Evaluation Group randomized trial **Duration** High 2 years	**Measures** *Access to healthy food options* (provision of a healthy breakfast before school) **Outcome(s) Affected** Dietary consumption of fruit (self-reported questionnaire)	**Net Positive for Nutrition in Lower-income Children (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. (N=596) Observational analysis at 1 year showed a higher proportion of primary-aged breakfast club attendees who reported eating fruit for breakfast in comparison to non-attendees (14% vs. 8%; Adjusted Odds Ratio (AOR) = 10.04; 95%CI=2.09, 48.18).	**Effective for Nutrition in Lower-Income Children (Study Population)** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in lower-income children (study population)	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Horne, Tapper (2004) London, England **Design** Intervention Evaluation Non-randomized trial **Duration** Low <6 months	**Measures** *Access to healthy food options* (access to fruits and vegetables in school at lunch and snack time) **Outcome(s) Affected** Dietary consumption of fruits and vegetables (direct observation, parent interviews)	**Net Positive for Nutrition for Lower-income, Racial and Ethnic Minority Children (School Food and Beverage Policies)** **Net Positive for Nutrition for 5-7 and 7-11 year old, Lower-income, Racial and Ethnic Minority Children (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Mean F&V consumption at lunch for 5-7 year olds increased from baseline to the intervention (from 20% to 69% for fruit, t=14.37[59], p<0.002; from 35% to 55% for vegetables, t=6.67[59], p<0.002) and from baseline to follow-up (from 20% to 56% for fruit, t=9.27[59], p<0.002; from 35% to 53% for vegetables, t=6.40[59], p<0.002). 2. Mean F&V consumption at lunch for 7-11 year olds increased from baseline to the intervention (from 47% to 86% for fruit, t=12.00[87], p<0.002; from 51% to 74% for vegetables, t=9.59[87], p<0.002) and from baseline to follow-up (from 47% to 65% for fruit, t=4.73[87], p<0.002; from 51% to 63% for vegetables, t=4.67[87], p<0.002). 3. Children who ate the least during baseline showed the largest increases in F&V consumption (from 4% at baseline to 68% at intervention to 48% at follow-up for fruit, from 11% at baseline to 48% at intervention to 43% at follow-up for vegetables). 4. Consumption of F&V at snack time for 5- 7 year olds was significantly higher at intervention than at baseline and follow-up, but there was no difference between baseline and follow-up levels. 5. There were significant increases in F&V consumption during the weekday at home for the intervention group compared to the control group (from 2.13 at baseline to 2.31 at intervention in the intervention school compared to a shift from 1.93 to 1.39 in the control school, p<0.05). 6. Vegetable consumption decreased at lunch for 5-7 year olds (from 16% to 6%, t=-5.86[76], p<0.002; baseline to follow-up = 16% to 10%, t=-3.26[76], p<0.002) and from baseline 2 compared to baseline 1 in 7-11 year old controls (36% to 20%, t=-9.36[128], p<0.002; baseline to follow-up = 36% to 23%, t=-6.07[128], p<0.002). Fruit consumption decreased among 7-11 year olds between baseline and follow-up (from 20% to 9%, t=-1.33[128], p<0.002). Control children that ate the most during baseline showed the largest decreases in F&V consumption (from 90% at baseline to 47% at intervention to 13% at follow-up for fruits, from 92% at baseline to 64% at intervention to 55% at follow-up for vegetables).	**Somewhat Effective for Nutrition for Lower-income, Racial and Ethnic Minority Children (Study Population)** **Somewhat Effective for Nutrition in 5-7 and 7-11 year old Lower-income, Racial and Ethnic Minority Children** Study design = Intervention evaluation Intervention duration = Low Effect size = Net positive for nutrition in lower-income, racial and ethnic minority children overall (study population) and 5-7 and 7-11 year olds	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Gatenby (2007) United Kingdom **Design** Intervention Evaluation Non-randomized trial **Duration** Not Reported	**Measures** *Access to healthy food options* (provision of free and healthy school meals) **Outcome(s) Affected** Dietary consumption of carbohydrates, sugars, fiber, sodium,fat, saturated fat and nutrients (iron, zinc, folate, vitamin C, magnesium, manganese) (photographs of food eaten, school reports)	**Net Positive for Nutrition in Lower-income Children (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Intervention school students had significantly lower mean intakes of protein (16.3g vs. 18.4g, p=0.02), energy (1.92 MJ vs. 2.74MJ, p<0.001), fat (20.6g vs. 29.3g, p<0.001), sugars (19g vs. 27.3g, p<0.001), carbohydrates (54.6g vs. 79.6g, p<0.001), and starch (27.4g vs 45.2g, p<0.001) than control school students. Intervention school students also consumed less saturated fat (6g vs 27.6g) than control school students but the difference was not significant. 2. The mean intake of calcium (221mg vs. 193mg, p=0.026) was significantly greater for intervention than control school students. 3. The mean intake of fiber (2.6g vs. 3.3g, p=0.001), sodium (624mg vs. 776mg, p<0.001), iron (1.79mg vs. 2.25mg, p<0.001), zinc (1.34mg vs. 1.69mg, p<0.001), folate (35.3µg vs. 49.5µg, p<0.01) and magnesium (42mg vs. 51.2mg, p<0.01) were significantly less for intervention students compared to control students. 4. Intervention school students mean consumption of carbohydrates (54.6g), energy (1.92MJ), sugars (19g), fiber (2.6g), sodium (624mg), iron (1.79mg), zinc (1.34mg), folate (35.3µg), vitamin C (10mg), magnesium (42mg), and manganese (0.43mg) did not meet CWT recommended levels of consumption. 5. Control school students mean consumption of fat (29.3g), saturated fat (27.6g), sugars (27.3g), fiber (3.3g), sodium (776mg), iron (2.25mg), zinc (1.69mg), folate (35.3µg), magnesium (51.2mg), manganese (0.44mg), and selenium did not meet CWT recommended levels of consumption 6. Across both the schools, only mean intakes of calcium (intervention 221mg, control 193mg) and vitamin A (intervention 254µg, control 301µg) met the CWT recommended guidelines.	**More Evidence Needed** Study design = Intervention evaluation Intervention duration = Not reported Effect size = Net positive for nutrition in lower-income children	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Saksvig, Gittelsohn (2005); Gittelsohn, Harris (1995); Hanley, Harris (1995) Canada **Design** Intervention Evaluation Before and after study **Duration** Medium 1 academic school year (1998-1999)	**Measures** *Access to a healthy school environment* (breaks for physical activity during classes, dietary consumption) **Outcome(s) Affected** Overweight/obesity (height and weight [body mass index]) and nutrition (24-hour recall)	**Net Negative for Overweight/obesity in Native American Children (School Food and Beverage Policies)** **Net Positive for Nutrition in Boys (Subset-School Food and Beverage Policies)** **Neutral for Nutrition in Girls (Subset-School Food and Beverage Policies)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. Mean BMI increased significantly between baseline (20.5, SD=4.3) and follow-up (21.5, SD=4.8, p<0.001). 2. Students who were obese at baseline had a greater mean change in BMI than students who were not (p<0.05). 3. Percent of body fat also increased significantly from baseline (29.8, SD=10.7) to follow-up (31.0 SD=10.8, p<0.001). NUTRITION: 4. The percent of energy from total fat was reduced from baseline (mean 33.8, SD=7.9) to follow- up (mean 31.9, SD=8.3, p<0.05). It decreased for boys (from 34% to 31%, p<0.05), but not for girls (from 34% to 33%, p<0.2). 5. Dietary intention changed in girls from baseline to follow-up (from 3.9 to 4.7, p<0.001) and boys (from 3.2 to 3.7, p<0.001) and for students who were obese at baseline (from 3.5 to 4.2, p<0.001). (Note: No results provided for physical activity breaks.)	**Not Effective for Overweight/obesity in Native American Children (Study Population)** **Effective for Nutrition in Boys** **Not Effective for Nutrition in Girls** Study design = Intervention evaluation Intervention duration = Medium Effect size = Net negative for overweight/obesity in Native American children, (study population) net positive for nutrition in boys, neutral for nutrition in girls	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Nelson, Lowes (2007) England **Design** Association Prosepctive cross-sectional study **Duration** Not Applicable	**Measures** *Access to healthy food and beverage options* (implementation of the 2001 National Nutritional Standards for school lunch programs) **Outcome(s) Affected** Consumption of vegetables, chips, fried potatoes, pasta, cereal, soft drinks, milk, butter, sweets (survey, direct observation)	**No Association for Nutrition in the Study Population (School Food and Beverage Policies)** **(Assumption: After the 2001 National Nutritional Standards were incorporated into the school lunch program, children would consume a much healthier diet.)** **School Food and Beverage Policies** NUTRITION: 1. In primary schools in 1997, students reported lower consumption of vegetables and salads, chips and potatoes cooked with fat, and pasta and other cereals than was observed directly in 2005. 2. In 1997, primary school students also reported higher consumption of soft drinks, milk and milk products, butter and margarine, sugar, preserves and confectionery and snacks than was observed directly in 2005. 3. In secondary schools in 1997, students reported lower consumption of higher-fat main dishes, chips and other potatoes cooked with fat, pasta and other cereals than was observed directly in 2004 4. In secondary schools in 1997, students reported higher consumption of vegetables and salads, sugar, preserves and confectionery, and savory snacks than was observed in 2004. (Note: Statistical significance was not assessed.)	**No Association for Nutrition for the Study Population** Study design = Association Effect size = No association for nutrition for the study population	**Maintenance** Not Reported **Sampling / Representativeness** High Participants were a nationally representative sample of primary and secondary school children in England
Author Veugelers, Fitzgerald (2005) Nova Scotia, Canada **Design** Association Cross-sectional study **Duration** Not Applicable	**Measures** *Access to healthy food options* (implementation of school nutrition policies) **Outcome(s) Affected** Overweight/obesity (height and weight [body mass index]) dietary consumption of fruits and vegetables (food frequency questionnaire), and physical activity (survey)	**Positive Association for Overweight/obesity for the Study Population (School Food and Beverage Policies)** **Positive Association for Nutrition for the Study Population (School Food and Beverage Policies)** **No Association for Physical Activity for the Study Population (School Food and Beverage Policies)** **(Assumption: Students participating in the Annapolis Valley Health Promoting Schools Program would have lower overweight/obesity and higher healthy food consumption and physical activity.)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. AVHPSP students had lower rates of overweight and obesity (17.9% overweight compared to 32.8% in control and 34.2% in the nutrition policy group; and 4.1% obese compared with 9.9% in the control and 10.4% in the nutrition policy group; no p-values provided). 2. Rates of overweight and obesity among AVHPSP students were significantly lower than rates among students from schools without a nutrition program (obesity OR=0.41, 95% CI=0.32-0.53; overweight OR=0.28, 95% CI=0.14-0.57; no p-values provided). NUTRITION: 3. AVHPSP students had higher consumption of fruits and vegetables (6.7 mean servings compared to 5.7 in control and 5.8 in the nutrition policy group), less calorie intake from fat (29.4% compared to 30.3% control and 30.3% nutrition policy) and higher dietary quality index scores (64.5 compared to 62.3 control and 62.1 nutrition policy). 4. Students from AVHPSP schools reported more consumption of fruits and vegetables (OR=1.23, 95% CI=1.07-1.40), better dietary quality (OR=1.29, 95% CI=1.11-1.50) and less fat intake (OR=0.36, 95% CI=0.11-1.13; p=ns) than students from schools without a nutrition program (not all p-values provided). However the decrease in fat intake was not statistically significant. PHYSICAL ACTIVITY: 5. AVHPSP students reported more participation in physical activity (not statistically significant).	**Positive Association for Overweight/ obesity in the Study Population** **Positive Association for Nutrition for the Study Population** **No Association for Physical Activity for the Study Population** Study design = Association Effect size = Positive association for overweight/ obesity and nutrition in the study population and no association for physical activity in the study population	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Competitive Food Policies-United States				
Author Foster, Sherman (2008) Pennsylvania **Design** Intervention Evaluation Group randomized trial **Duration** High 2 years	**Measures** *Access to healthy food and beverage options* (implementation of healthy food policies at schools to eliminate unhealthy snacks and beverages) **Outcome(s) Affected** Overweight/obesity (height and weight [body mass index]), physical activity, and dietary consumption of energy, fat and fruit/vegetables (self-reported questionnaire)	**Net Positive for Overweight/obesity in the Study Population (School Food and Beverage Policies)** **Net Positive for Overweight/obesity in African-American Children (School Food and Beverage Policies)** **Neutral for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. After 2 years, significantly fewer children in the intervention schools (7.5%) became overweight compared to the control schools (14.9%). After controlling for gender, race/ethnicity and age, the predicted odds of incidence of overweight were ~33% lower for the intervention group (odds ratio [OR]= 0.67, 95% CI=0.47 – 0.96; p<0.05). 2. There were no differences between intervention and control schools for obesity incidence. After collapsing the overweight and obese weight categories, the predicted odds of incidence of overweight or obesity were ~15% lower for the intervention group (OR: 0.85, 95% CI=0.74 – 0.99; p<0.05). 3. After 2 years, the predicted odds of overweight prevalence were 35% lower for the intervention group (adjusted OR: 0.65; 95%CI=0.54 to 0.79; p<0.0001). There were no differences between intervention and control schools for obesity prevalence. 4. After controlling for gender, age and baseline prevalence, Black students in the intervention schools were 41% less likely to be overweight than those in the control schools after 2 years (OR: 0.59, 95% CI=0.38 – 0.92; p<0.05). 5. The predicted odds of remission of overweight or obesity were ~32% higher for the intervention group compared to control group (OR: 1.32, 95% CI=1.09 – 1.60; p<0.01). NUTRITION: 6. Decreases in self reported amounts of the consumption of energy, fat and fruit/vegetables were reported by students at intervention and control schools, with no differences between the two groups.	**Effective for Overweight/ obesity in the Study Population** **Effective for Overweight/ obesity in African-American Children** **Not Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for overweight/ obesity in the study population and African-American children and neutral for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author French, Story (2004); Fulkerson, French (2004) Minnesota TACOS **Design** Intervention Evaluation Group randomized trial **Duration** High 2 years	**Measures** *Access to healthy food options* (school policy to increase the availability of lower fat a la carte foods in secondary school cafeterias) **Outcome(s) Affected** Dietary consumption (sales data, student survey) and food sales (lower-fat foods, fruits and vegetables)	**Neutral for Nutrition in the Study Population (School Food and Beverage Policies)** **Net Positive for Purchasing Behavior in the Study Population** **School Food and Beverage Policies** NUTRITION: 1. (n=75) There were no intervention-related differences in student-reported food choices data on any of the following variables: ratio of lower-fat to higher-fat food choices, added fats score, fruit and vegetable score. PURCHASING BEHAVIOR: 2. There were no significant differences from baseline to follow-up in the intervention group for any of the food service revenue variables examined. 3. Intervention schools showed a higher mean percentage of sales of lower-fat foods in Yr 1 (27.5% vs. 19.6%, p=0.096) and Yr 2 (33.6% vs. 22.1%, p=0.042) than control schools. 4. Intervention schools showed a steeper rate of increase in percentage of sales of lower-fat foods in Yr 1 (10% increase in intervention, compared to 2.8% decrease in control, p=0.002). Yr 2 did not differ significantly (2.0% vs. 1.2%, p=0.76).	**Not Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect Size = Neutral for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Schwartz, Novak (2009) Connecticut **Design** Intervention Evaluation Before and after study **Duration** High 2 years	**Measures** *Access to healthy food and beverage options* (provision of healthier versions of snacks sold at school) **Outcome(s) Affected** Dietary consumption of snacks and beverages (self-reported questionnaire)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Intervention schools decreased consumption of sugar sodas, teas and sports drinks from year 1 to year 2 (β=-0.23, p<0.05). Comparison schools increased consumption. 2. Intervention schools significantly increased consumption of water and 100% juice from year 1 to year 2 (β=0.33, p<0.05). No change in comparison schools. 3. Intervention schools consumed more chips (not baked) than comparison schools (β=0.23, p<0.05). Difference was qualified by the observation that intervention schools decreased consumption of chips from year one to year two, as comparison schools increased slightly (β=-0.30, p<0.05). 4. Intervention schools increased consumption of baked chips, pretzels, popcorn and crackers from year 1 to year 2 (β=0.29, p<0.05). No change in comparison schools. 5. Intervention schools increased consumption of fruit, chewy fruit snacks, yogurt, granola bars, popsicles, and frozen fruit bars from year 1 to year 2 (β=0.15, p<0.05). No change in comparison schools. 6. No changes in reported snack and beverage consumption at home among either group, except for sugary drinks which increased from year 1 to year 2 in both groups (β=0.19, p<0.05), with a greater increase in the comparison schools (β=-0.18, p<0.05).	**Effective for Nutrition in the Study Population** Study design = Intervention Evaluation Intervention duration = High Effect size = Net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Cullen, Thompson (2005) Texas **Design** Association Cross-sectional study **Duration** Not Applicable	**Measures** *Access to healthy food and beverage options* (portion sizes of snack bar items and beverages available to students) **Outcome(s) Affected** Potential energy savings from portion-size reductions in food items (sales data)	**Not Reported (for desired health outcomes)** **Positive Association for Purchasing Behavior in the Study Population (School Food and Beverage Policies)** **(Assumption: Reduced portion sizes and less access to unhealthy foods will lead to lower calorie consumption.)** **School Food and Beverage Policies** PURCHASING BEHAVIOR: 1. 379 food/beverage items were sold daily in the snack bars. This represented a daily average of 111 kcal sold per student over the 180-day school year. Kilocalories per day per student were reduced to 63 when the reduced portion sizes were substituted for the full size. This represents a savings of 47 kcal/day/student. 2. Over a 180-day school year, an energy deficit equivalent to about 2lb could occur if students replaced the large portion-sized snacks and beverages with the smaller sizes.	**More Evidence Needed** Study design = Association Effect size = Not reported	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Vecchiarelli, Takayanagi (2006) California **Design** Association Cross-sectional study **Duration** Not Applicable Only cross-sectional data provided. On-going policies in the Los Angeles Unified School District. The Healthy Beverage Resolution policy (soda ban) went into effect January 1, 2004 and the Obesity Prevention Motion (junk food ban) went into effect on July 1, 2004.	**Measures** *Access to healthy food and beverage options* (policies banning unhealthy food and drinks at schools) **Outcome(s) Affected** Dietary consumption of snacks and beverages (survey)	**Positive Association for Nutrition in the Study Population (School Food and Beverage Policies)** **(Assumption: By banning soda and junk food, individuals will have decreased access to unhealthy foods choices, which will lead to less consumption of soda and junk food.)** **School Food and Beverage Policies** NUTRITION: 1. Students who reported an impact of the soda ban consumed fewer of the prohibited beverages compared to students who perceived no impact at school (72% vs. 39.8%; $X^2[2]=48.311$, $p<0.001$), and at home/outside of school (56.1% vs. 16.0%; $X^2[2]=67.779$, $p<0.001$). 2. 55.5% of all students reported that the healthy beverage policy impacted the beverages they drank at school, whereas only 16.2% of all students reported the policy impacted the beverages they drank at home/outside of school ($X^2[1]=20.59$, $p<0.001$). 3. 52.6% of all students reported that the junk food ban impacted the snacks they ate at school, whereas only 20.2% of all students reported the policy impacted the snacks they ate at home/outside of school ($X^2[1]=30.073$, $p<0.001$) 4. Students who reported an impact from the junk food ban said they consumed fewer of the banned snacks compared to the students who reported no impact at school (80.5% vs. 31.7%; $X^2[2]=100.520$, $p<0.001$), and at home/outside of school (57.5% vs. 14.6%; $X^2[2]=86.347$, $p<0.001$). 5. Students who perceived an impact from the junk food ban paid more attention to what they ate compared to the students who did not perceive any impact at school ($X^2[2]= 14.285$, $p=0.001$) and at home/outside of school ($X^2[2]= 68.981$, $p<0.001$). (Note: Subgroup effects only seen for those that perceived an impact from the policies there were no sex differences in students' overall perception of an impact of either policy.)	**Positive Association for Nutrition in the Study Population** Study design = Association Effect size = Positive association for nutrition in the study population	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported
Author Neumark-Sztainer, French (2005) Minnesota **Design** Association Cross-sectional study **Duration** Not Applicable	**Measures** *Access to healthy food and beverage options* (vending machine and open/closed lunch policies) **Outcome(s) Affected** Dietary consumption of snacks and beverages (surveys, vending machine sales data)	**Positive Association for Nutrition in the Study Population (School Food and Beverage Policies)** **Positive Association for Purchasing Behavior in the Study Population (School Food and Beverage Policies)** **(Assumption: Healthier school food policies [closed campus, restrictions on vending machines] will lead to decreased access of unhealthy foods, which will lead to decreased consumption of unhealthy foods.)** **School Food and Beverage Policies** NUTRITION: 1. Students at schools with open campus lunch policies were more likely to eat lunch at a fast food restaurant (0.7 days/week vs. 0.2 days/week, $p<0.001$) or a convenience store (0.3 days/week vs. 0.1 days/week, $p<0.001$) than students at schools with closed campus policies. 2. No significant differences for eating from the main lunch line, eating a la carte foods, or bringing lunch from home between students at school with open campus policies vs. closed campus policies. PURCHASING BEHAVIORS: 3. In schools with vending machine policies, students reported making snack food purchases an average of 0.5 days/week compared to an average of 0.9 days/week in schools without policies ($p<0.001$). 4. Student snack food purchases from vending machines were more frequent among students from schools with a greater number of machines (1.1 days/week for 3-6+ machines, 0.8 days/week for 1-2 machines and 0.4 days/week for 0 machines, $p<0.001$). 5. Policies regarding hours of operation of machines were not associated with snack food purchases in the 16 schools that had snack machines. 6. Student soft drink purchases from vending machines were not significantly associated with the number of soft drink vending machines, but were significantly lower in schools in which machines were turned off during lunchtime (1.4 days/week) compared to schools where they were not turned off (1.9 days/week; $p<0.043$).	**Positive Association for Nutrition in the Study Population** Study design = Association Effect size = Positive association for nutrition in the study population	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Comprehensive School Food Policies-United States				
Author Harrell, Davy (2005) Mississippi **Design** Intervention Evaluation Non-randomized trial **Duration** Low <6 months	**Measures** *Access to healthy food and beverage options* (addition of fresh fruits and vegetables in school cafeterias and healthier options in vending machines) **Outcome(s) Affected** Overweight/obesity (height and weight [body mass index], waist circumference, body fat) and dietary consumption (24hr dietary recall)	**Net Neutral for Overweight/obesity in Lower-income Children (School Food and Beverage Policies)** **Net Positive for Nutrition in Lower-income Children (School Food and Beverage Policies)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. There was a change in BMI from baseline to follow-up in the intervention (from 22.7±5.4 to 22.7±5.6 kg/m^2) and control groups (from 23.0±7.8 to 21.8±7.5 kg/m^2), with control group BMI significantly lower at follow-up ($p<0.05$). 2. Waist circumference increased in both the intervention (from 73±14 to 75±14cm) and control groups (from 72±16 to 73±17cm) from baseline to follow-up, but the difference between the two groups was not significant. 3. There was a decrease in the percentage of body fat from baseline to follow-up in the intervention (from 27% ± 12% to 26% ± 11%) and control groups (from 28% ± 13% to 24% ± 12%), with a significant difference between the 2 groups at follow-up ($p<0.05$). NUTRITION: 4. A significant reduction in reported mean energy intake was noted in both intervention (from 1811 ± 697 kcal to 1749 ± 615 kcal) and control groups (2046 ± 767 to 1892 ± 695) over time ($p<0.0001$). 5. As a result of the intervention, there was a small but significant increase in vegetable intake in the intervention compared with the control group (+0.1 servings vs. -0.2 servings, $p<0.05$). No changes in fruit consumption were detected. 6. As a result of the intervention, there was a significant decrease in soft drink consumption in the intervention as compared with the control group (-2 fl. oz. vs. +1.3 fl. oz., $p<0.05$).	**Not Effective for Overweight/obesity in Lower-income Children (Study Population)** **Somewhat Effective for Nutrition in Lower-income Children (Study Population)** Study design = Intervention evaluation Intervention duration = Low Effect size = Net neutral for overweight/obesity and net positive nutrition in lower-income children (study population)	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Blum, Davee (2007); Blum, Davee (2008); Davee, Blum (2005) Maine **Design** Intervention Evaluation Non-randomized trial **Duration** Medium 1 school year	**Measures** *Access to healthy food and beverage options* (provision of healthier lunch items, modified a la carte selections and vending machine hours, and portion modifications) **Outcome(s) Affected** Beverage consumption (food frequency questionnaire)	**Net Positive for Nutrition in Girls (School Food and Beverage Policies)** **Net Positive for Nutrition in Boys (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. Sugar sweetened beverage (SSB) consumption was reduced for intervention and control girls (-0.1 and -0.12 servings/day, respectively; F=53.69, p=0.001) and boys (-0.09 and -0.22 servings/day, respectively; F=22.87, p=0.001) from pre- to post-intervention. 2. Diet soda consumption decreased for intervention girls (-0.06 servings/day), but increased for control girls (+0.05, p=0.01). No significant effects seen for boys. 3. Milk consumption increased for intervention girls and boys (+0.03 servings/day for girls, +0.09 servings/day for boys) and decreased for control girls and boys (-0.12 servings/day for girls, -0.37 servings/day for boys; girls F=33.38, p=0.001; boys: F=10.37, p=0.001). 4. Juice consumption decreased for intervention girls and increased for control girls (-0.13 and +0.8 servings/day, respectively; F=23.50 p=0.001). Juice consumption increased for both intervention and control boys (+0.05 and no change, respectively; F=24.91, p=0.001). ENVIRONMENT CHANGE: 5. The number of items meeting low fat, low sugar and portion criteria increased for a la carte, snack vending machine and beverage vending machine items (data available in the intervention table). 6. There were larger decreases in the availability of SSB and larger increases in milk and juice availability in the intervention versus control groups (data available in the intervention table).	**Effective for Nutrition in Girls** **Effective for Nutrition in Boys** Study design = Intervention evaluation Intervention duration = Medium Effect size = Net positive for nutrition in boys and girls	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Wojcicki, Heyman (2006) California **Design** Intervention Evaluation Before and after study **Duration** High 12-24 months	**Measures** *Access to healthy food and beverage options* (improved nutrition standards to foods and beverages offered in schools; 1% or fat free milk with no bovine growth hormone, healthier foods, no soda, caffeine or artificial sweeteners, max size 12 fl. Oz., food items must be low in fat and sugar and higher in nutrients, portion size limits on snacks and desserts) **Outcome(s) Affected** Federally subsidized school meal participation, food sales (sales data, school records)	**Not Reported (for desired health outcome)** *****Note: Only descriptive data is presented.** **School Food and Beverage Policies** SCHOOL LUNCH PARTICIPATION: 1. 67.5% of high schools showed an increase in participation in free lunch program, while only 15% showed a decrease. 2. Increases in free lunch program participation may be explained, to some extent, by the increase in the percentage of students eligible for free lunches from the 2002-2003 to the 2003-2004 school year (mean increase: 7.2%). 3. While participation in the reduced-price and paid lunch program decreased in the 2003-2004 school year (50% and 47.5% of schools, respectively), overall participation in the lunch program (paid, free and reduced price) increased, with 55% of schools demonstrating increases in sales. 4. Decrease in the number of students participating in a la carte/snack bar program. SALES: 5. A total mean increase in sales of $1,706 for the 40 schools in the San Francisco Unified School District. 6. Only 5.1% of schools showed an increase in a la carte/snack bar sales and schools lost an average of $13,155 in a la carte/snack bar sales. 7. At the time of this article, profits had not been tabulated for the 2003-2004 school year, and thus the effects of the menu changes on overall profits were unclear.	**More Evidence Needed** Study design = Intervention evaluation Intervention duration = High Effect size = Not reported	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Cullen, Watson (2009) Texas **Design** Intervention Evaluation Before and after study **Duration** High 2 school years	**Measures** *Access to healthy food options* (implementation of policy to restrict portion sizes and fat content of unhealthy foods and beverages, elimination of high-fat milk) **Outcome(s) Affected** Food items served (fruits and vegetables) and snack bar sales (daily food production records, sales data)	**Not Reported (for desired health outcome)** **Net Positive for Purchasing Behavior in Lower-income Children (School Food and Beverage Policies)** **(Note: Direct health behaviors and outcomes like dietary consumption not reported, snack bar sales is used as a proxy)** **School Food and Beverage Policies** PURCHASING BEHAVIOR: 1. The sale of large bags of chips decreased postpolicy (2004-2005) from 9.6 to 0.2 servings (p=0.006), whereas the sale of baked chips increased from 15.3 to 23.6 servings per day postpolicy (p=0.048). 2. There was a non-significant decrease in candy sales from 12.8 to 1.1 servings per day, and there were no significant changes in sales of dessert foods or ice cream. ENVIRONMENT CHANGE: 3. There was a significant difference between school years for servings of high-fat vegetables (p<0.001). Regardless of school and district size, fewer portions of high-fat vegetables per student were served during 2004-05 (0.46 servings) than during 2003-04 (0.68). 4. Regardless of school year or district size, secondary schools reported serving more portions of high-fat vegetables per student (0.80 and 0.54 servings) than did primary schools (0.49 and 0.36 servings). The reduction was greater in schools located in larger districts (0.71-0.38 servings, p<0.001) than in schools in smaller districts (0.65-0.55 servings; p=0.011). 5. There were no significant differences for regular or nonfried vegetables for any analyses. 6. There was a significant district size main effect for milk (p=0.030). Schools in the smaller districts served more milk (1.31 servings in both years) than did larger districts (0.83 and 1.02 servings). 7. There was no significant improvement in fruit servings between years, but there was a significant (p=0.001) school-level main effect for average daily servings of fruit served per student. Regardless of district size, primary schools reported serving more portions of fruit per student both school years (0.73 and 0.74 servings) than did secondary schools (0.40 and 0.45 servings). 8. 75% of the elementary schools offered french fries 3 or fewer times per week during 2003-2004; this increased to 89% in 2004-2005. Forty-two percent of the middle schools offered french fries 3 or fewer times per week during 2003-2004; this increased to 62% during 2004-2005.	**More Evidence Needed** Study design = Intervention evaluation Intervention duration = High Effect size = Not reported	**Maintenance** Not Reported **Sampling / Representativeness** High There were no significant differences in district size, ethnicity or percentage of students eligible for free or reduced-price meals between the Texas school districts that sent data, those that did not and state district averages.

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Cullen, Hartstein (2007); Hartstein, Cullen (2008) California, North Carolina, Texas **Design** Intervention Evaluation Before and after study **Duration** Low <6 months	**Measures** *Access to healthy food and beverage options* (improved healthy food and beverage choices in vending machines, a la carte areas and cafeterias; reduced portion sizes, limit sugar sweetened beverages, and vending machines turned off during meals) **Outcome(s) Affected** Purchasing behaviors (food sales records)	**Not Reported (for desired health outcome)** **Net Positive for Purchasing Behavior in Racial and Ethnic Minority Children (School Food and Beverage Policies)** **(Note: Sales are used as a proxy for consumption.)** **School Food and Beverage Policies** PURCHASING BEHAVIOR: 1. There were significant changes in nutrient sales per student, with an increase in % kcal from protein ($p<0.05$) and ounces of water ($p<0.01$), and decrease in sales of sweetened beverages ($p<0.01$), and regular chips ($p<0.05$) across all 6 schools. 2. There was a significant reduction in kcal density per item sold ($p<0.01$). The 2nd Texas school showed a reduction in kcal density from 277 to 216. Reductions at other schools were more modest (1 to 12 kcal per item sold). The 2nd CA school increased kcal density by 9 kcal per item sold. 3. There were no changes in fat or % fat per item sold. 4. Large-sized drinks and chips were eliminated from a la carte lines in all schools. Overall, ounces of sweetened beverages and chips sold declined by 29% and 16%, respectively; ounces of water sold increased (51%); and sales of low-fat/reduced-fat chips increased (775%). 5. There was no significant change in number of kilocalories sold per student from week 1 to week 6. However, the 2 Texas schools showed small but important savings of 31 and 24 kcal per student per day. ENVIRONMENT CHANGE: 6. At baseline, 1 school met 1 intervention goal (offering reduced fat chips as 25% of their snack chips). At follow-up all goals (see intervention components) were met by 5 schools with 1 school meeting all but one goal (offering reduced-fat chips). 7. Across the 6 schools the total NSLP (National Student Lunch Program) fruits and vegetables (F&V) served increased from 1.10 to 1.42 servings. Vegetable servings increased from 0.65 to 0.79, and fruit servings increased from 0.23 to 0.42.	**More Evidence Needed** Study design = Intervention evaluation Intervention duration = Low Effect size = Not reported	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Grainger, Senauer (2007) Minnesota **Design** Intervention Evaluation Time series study **Duration** High >24 months	**Measures** *Access to healthy food and beverage options* (increased access to home-made and nutritionally rich foods, no access to soft drinks in vending machines, decreased access to high-fat foods) **Outcome(s) Affected** Dietary consumption (USDA's Healthy Eating Index, Relative Healthiness Index, point-of-sale data)	**Not Reported (for desired health outcomes)** **Net Positive for Purchasing Behavior in the Study Population (School Food and Beverage Policies)** **Net Positive for Purchasing Behavior in Females (School Food and Beverage Policies)** **Net Positive for Purchasing Behavior in Males (School Food and Beverage Policies)** **School Food and Beverage Policies** PURCHASING BEHAVIOR: 1. Both nutritional quality indexes increased, suggesting that students made healthier food choices over time. In November 2002, the average RHI-DDI was -1.237, which improved to 2.571 by April 2005. Likewise, the mean RHI-HEI increased from 23.062 to 27.656. 2. The linear time trend variable was positive and significant ($p<0.01$) in every regression analysis suggesting that there was an improvement in students' diets over time and that these improvements were associated with changes implemented by the school district. 3. Based on random effects regression, females were more likely to make healthier food choices than white males (random effects RHI-HEI = 3.95769 [0.64318], $p<0.01$; random effects RHI-DDI = 2.13771 [0.34937], $p<0.01$). However, males had greater improvement in the healthiness of their choices than females over time (random effects RHI-HEI = 0.65722 [0.15577], $p<0.01$; random effects RHI-DDI = 0.30392 [0.07738], $p<0.01$) 4. There was no significant effect on healthier food choices among students who received a free or reduced-price NSLP meal, suggesting that poorer students who received assistance buying lunch were able to make food choices that were as healthy as other students.	**More Evidence Needed** Study design = Intervention evaluation Intervention duration = High Effect size = Not reported	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Cullen, Watson (2006); Cullen, Watson (2008) Texas **Design** Intervention Evaluation Before and after study **Duration** High 3 years	**Measures** *Decreased access to unhealthy foods and beverages* (decreased: portion sizes of high-fat and sugar snacks, high-fat vegetable servings, and sugar sweetened beverages) **Outcome(s) Affected** Dietary consumption (food records)	**Net Positive for Nutrition in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: *After nutrition policy* 1. Intake of daily energy (from 2646kJ to 2990kJ), protein (from 22.2g to 28.2g), fiber (from 3.7g to 5.1g), vitamin A (from 151RE to 220RE), vitamin C (from 13.9mg to 26.9mg), and calcium (from 292mg to 454mg) were significantly higher in year 3 than year 1 ($p<0.05$). 2. More milk (from 2.44oz to 6.54oz) and vegetables (from 0.29 servings to 0.89 servings) and less sweetened beverages (from 5.43oz to 1.49oz), soft drinks (from 4.76oz to 0.11oz) and snack chips (from 0.21 servings to 0.04 servings) were consumed per day in year 3 than during year 1 ($p<0.05$). 3. Comparing year 3 to year 1, more servings of regular vegetables (99% vs. 83%) and milk (99% vs. 88%) were consumed from the NSLP meal and fewer dessert foods (15% vs. 24%), soft drinks (0% vs. 5%) and snack chips (4% vs. 10%) were consumed from the NSLP meal ($p<0.025$). 4. Comparing year 3 to year 1, the snack bar provided more sweetened beverages (61% vs. 13%), candy (52% vs. 24%) and dessert foods (20% vs. 7%), and fewer high-fat vegetables (1% vs. 24%), milk (1% vs. 9%) and snack chips (1% vs. 41%; $p<0.025$). 5. The vending machines provided fewer sweetened beverages (19% vs. 72%), soft drinks (11% vs. 80%), candy (5% vs. 39%), dessert foods (0% vs. 22%) and snack chips (6% vs. 31%) in year 3 than year 1 ($p<0.025$). However, more of these items were brought from home in year 3 (chips 90%, soft drinks 66%, dessert foods 64%, candy 40%; $p<0.025$). ENVIRONMENT CHANGE: *Before nutrition policy* *6.* The number of vending machines increased from 21 at baseline to 42 during year 1. There was an increase in the number of candy and snack chips available in the vending machines. *After nutrition policy* *7.* Total vending machines in schools dropped from 42 during year 1 to 23 during year 2 and the percentage of schools dispensing beverages decreased from 83% to 61%.	**Effective for Nutrition in the Study Population** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in the study population	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported
Author Ritenbaugh, Teufel-Shone (2003); Teufel, Ritenbaugh (1998) New Mexico **Design** Intervention Evaluation Time series **Duration** High 4 years	**Measures** *Access to healthy food environment* (providing water in coolers, increased access to fruits and vegetables, decreased access to high-fat foods and sugary soft drinks) **Outcome(s) Affected** Plasma glucose and insulin levels, sugar-sweetened beverage consumption, use of wellness facility (biological measures, vending machine sales data)	**Net Positive for Nutrition in Native American Students (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: 1. By year 3 the 400 students of Zuni high school were consuming virtually no sugared soft drinks at school (down from 800 12-ounce cans/week/400 students). 2. Environmental change accounted for a decrease in consumption of sugared soft drinks of about 4.8 ounces/day/student.	**Effective for Nutrition in Native American Students (Study Population)** Study design = Intervention evaluation Intervention duration = High Effect size = Net positive for nutrition in Native American students (study population)	**Maintenance** Not Reported **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Cullen, Eagan (2000) & Cullen, Zakeri (2004) Texas **Design** Association Cross-sectional study **Duration** Not Applicable	**Measures** *Access to healthy food options* (access to the National School Lunch Program [NSLP] and access to a snack bar) **Outcome(s) Affected** Dietary consumption (self-reported food records)	**Positive Association for Nutrition in the Study Population (Cohort 1) (School Food and Beverage Policies)** **Negative Associaiton for Nutrition in the Study Population (Cohort 2) (School Food and Beverage Policies)** **School Food and Beverage Policies** NUTRITION: *Cohort 1:* 1. Compared to 4th graders (NSLP only), 5th graders (NSLP plus snack bar) consumed lower mean intakes of fruit (0.11 vs. 0.24 servings, p<0.001), juice (0.01 vs. 0.02 servings, p<0.05), total vegetables (0.47 vs. 0.54 servings, p<0.05) and total fruits, juices and vegetables (FJVs) (0.6 vs. 0.8 servings, p<0.001). There was a main effect for family education as students whose parents reported a high school education or less consumed less juice, but more regular vegetables, total vegetables and total FJVs (data not shown). 2. 5th grade students who ate only snack bar meals reported significantly lower regular (0.08 vs. 0.37 servings, p<0.001) and total vegetable (0.37 vs. 0.61 servings, p<0.001) servings and total FJVs (0.40 vs. 0.82, p<0.001), and more high-fat vegetables (0.29 vs. 0.24 servings, p<0.05), compared to 5th grade students who ate the NSLP meal only. 3. Controlling for FJV preferences in the FJV consumption model did not change the main effect for the grade level differences in consumption. *Cohort 2:* *4.* Fourth to Fifth Graders: Servings of fruits, regular vegetables, and milk decreased 33%, 42%, and 35%, respectively (p<0.001 for all), from year 1 to year 2 and servings of high-fat vegetables and sweetened beverages increased 68% and 62%, respectively (p<0.001 for both). 5. Fifth to Sixth Graders: High fat vegetable (p<0.001) and milk (p<0.05) consumption increased 30% and 14%, respectively, from year 1 to year 2 while consumption of regular vegetables (p<0.05) and sweetened beverages (p<0.05) decreased 10% and 12% respectively. Fruit consumption did not change. 6. In year 2, the fifth to sixth grade group reported significantly lower fruit (0.10 vs. 0.12 servings, p<0.05) and significantly higher sweetened beverage (4.3 vs. 3.4 oz, p<0.05) consumption compared with the fourth to fifth grade group.	**Positive Association for Nutrition in the Study Population (Cohort 1)** **Negative Association for Nutrition in the Study Population (Cohort 2)** Study design = Intervention evaluation Intervention duration = High Effect size = Positive association for nutrition in the study population and negative associaiton for nutrition in the study population	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported
Author Kubik, Lytle (2005) Minneapolis/ St. Paul, Minnesota **Design** Association Cross-sectional study **Duration** Not Applicable	**Measures** *School food and beverage policies* (allowing food and/ or beverages in the classroom and hallways; food and food coupons; and fundraising efforts that included food sales) **Outcome(s) Affected** Overweight/obesity (self-reported height and weight)	**Positive Association for Overweight/obesity in the Study Population (School Food and Beverage Policies)** **(Assumption: Schools with poor food practices have greater access to unhealthy food, which will lead to increased consumption of unhealthy food and thus higher body mass index.)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. The school-wide food practices scale was positively associated with student's BMI. For every additional poor food practice allowed by a school (e.g., food allowed in classrooms, food used as a reward), student BMI increased by 10% (p=0.03). OTHER: 2. The mean number of school food practices allowed in each school was 3 (on a 1-7 scale). 3. The most prevalent school food practice was the use of food as a reward or incentive for students (69%) and in classroom fundraising (56%).	**Positive Association for Overweight/ obesity in the Study Population** Study design = Association Effect size = Positive association for overweight/ obesity in the study population	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Gonzalez, Jones (2009) Location not reported **Design** Association Cross-sectional study **Duration** Not Applicable	**Measures** *Access to healthy food options* (restriction of snacks in school) **Outcome(s) Affected** Dietary consumption (self-reported questionnaire)	**Negative Association for Nutrition in the Study Population (School Food and Beverage Policies)** **(Assumption: School policies restricting snacks will create less access to unhealthy snacks, which will lead to the greater consumption of fruits and vegetables [F&V].)** **School Food and Beverage Policies** NUTRITION: 1. In general, children did not consume the recommended daily intake of F&V. Nearly 40% and 61% of the children reported consuming F&V < 1 time per day respectively. Only 9% and 16% of the children consumed F&V > 3 times per day, respectively. 2. Compared to children who attended schools without restricted-snack availability, children who attended schools with restricted-snack availability had ~3 percentage points lower frequency of consumption of F&V. 3. After accounting for clustering by schools, there was a difference of 0.11 and 0.15 in the times/day of F&V consumption, respectively, between the children who attended schools with and without restricted-snack availability. 4. Compared to children in schools with restricted-snack availability, children in schools without restricted availability were 10% less likely to report consuming fruit occasionally (Coefficient=-0.110, OR=0.896, p=0.025) and 3% less likely to report consuming vegetables occasionally (Coefficient=-0.03, OR=0.97, p=0.531). 5. Compared to children in schools with restricted-snack availability, children in schools without restricted availability were 13% less likely to report frequent consumption of fruit (Coefficient=-0.144, OR=0.866, p=0.05) and 21% less likely to report frequent consumption of vegetables (Coefficient=-0.238, OR=0.788, p=0.001). 6. Type or number of snacks available did not play a significant role in defining the association between the availability of snacks and consumption of fruits and vegetables and a cluster analysis revealed no meaningful patterns among the type of snacks available (results not reported).	**Negative Association for Nutrition in the Study Population** Study design = Intervention evaluation Effect size = Negative association for nutrition in the study populatin	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Gordon, Crepinsek (2009); Gordon, Cohen (2009); Story (2009); Briefel, Wilson (2009); Condon, Crepinsek (2009); Fox, Dodd (2009); Briefel, Crepinsek (2009); Fox, Gordon (2009); Clark, Fox (2009); Gleason, Dodd (2009); Crepinsek, Gordon (2009) United States **Design** Association Cross-sectional study **Duration** Not Applicable Only cross-sectional data provided	**Measures** *School healthy eating policies and practices* (access to the National School Lunch Program [NSLP] and School Breakfast Program [SBP], presence of school stores or snack bars) **Outcome(s) Affected** Overweight/obesity (height and weight [body mass index]) and dietary consumption (24-hour recalls)	**Positive Association for Overweight/obesity in the Study Population (School Food and Beverage Policies)** **Positive Association for Nutrition in the Study Population (School Food and Beverage Policies)** **(Assumption: Participation in the National School Lunch Program and the School Breakfast Program leads to greater access to healthy food, which leads to greater consumption of healthy food and lower body mass index and overweight/obesity.)** **School Food and Beverage Policies** OVERWEIGHT/OBESITY: 1. The estimated effect of usual National School Lunch Program (NSLP) participation on children's BMI was positive, although small in magnitude and not statistically significant. 2. Participation in the School Breakfast Program (SBP) was estimated to have a negative association with students' BMI. For every one-breakfast-per-week increase in usual SBP participation, BMI declined by 0.15 points ($p<0.05$). 3. The estimated effect of SBP participation on BMI z score, which standardized the BMI measure across age and sex, was negative (-0.028) and statistically significant ($p<0.05$). 4. Among elementary school children, offering french fries or dessert in school lunches more than once per week was associated with a significantly higher likelihood of obesity (french fries OR=2.70; $p<0.01$, dessert OR= 1.78, $p< 0.05$). 5. Among middle school children, the availability of low-nutrient, energy dense foods in vending machines in or near the foodservice area was associated with a higher BMI z score ($\beta= -0.21$; $p<0.05$). However, the availability of these foods for a la carte purchase in the cafeteria was associated with a lower BMI z score ($\beta= -0.32$; $p<0.01$). 6. Among high school aged children, none of the associations between school food environments and practices and BMI z scores or the likelihood of obesity were statistically significant. NUTRITION: 7. Among secondary school children, NSLP participants consumed more energy at school (808 kcal vs 533 kcal, $p<0.01$) and over the entire day (2,250 kcal vs. 2,076 kcal, $p<0.01$), but consumed less energy away from school (208 kcal vs. 309 kcal, $p<0.01$). 8. On average, participants consumed more energy from french fries and similar potato products in elementary school and significantly less from SSB, candy, and chips/salty snacks compared with nonparticipants ($p<0.01$). 9. More than twice as many participants as nonparticipants consumed at least one vegetable at lunch (51% vs. 23%, $p<0.01$). The differences remained significant ($p<0.01$) even after excluding french fries and similar potato products. 10. School meal participation was significantly associated with more energy from low-nutrient, energy-dense foods in high school, 73 kcal more for breakfast ($p<0.01$) and 61 kcal more for lunch participation ($p<0.001$); in middle school, 38 kcal more for breakfast participation ($p<0.05$) but no difference for lunch. 11. Participants were significantly less likely than nonparticipants to consume desserts and snack foods at lunch (38% vs. 52%, $p<0.01$). 12. NSLP participants had higher intakes of calcium, sodium (high-school only), potassium, fiber, magnesium, phosphorus, vitamin C, B-6, folate and thiamin (data not shown). 13. Consumers of any sugar-sweetened beverages at school were significantly less likely to be participants in the NSLP or both the school lunch and breakfast programs (both $p<0.01$). 14. In elementary schools, NSLP participants consumed less than one third the mean amount of energy from sugar-sweetened beverages as nonparticipants (11 kcal vs 39 kcal, $p<0.01$). 15. Nonparticipants were more than 3 times as likely as participants (56% vs. 18%) to consume a beverage other than milk or 100% fruit juice at lunch ($p<0.01$). 16. SBP participants were more likely to drink milk (75% vs. 53%), consume 100% fruit juice or other type of fruit (63% vs. 30%), eat sweet rolls and doughnuts (17% vs. 10%) and biscuits, croissants or cornbread (10% vs. 2%) at breakfast than non-participants ($p<0.05$). 17. Overall, children who ate a school lunch were less likely than children who did not eat a school lunch to consume competitive foods from any source (36% versus 45%, $p<0.01$) 18. Attending a school without stores or snack bars selling foods or beverages was estimated to reduce sugar-sweetened beverage intake at school by 22 kcal/ school day and 28 kcal/school day among middle school and high school children, respectively ($p<0.01$). *(continued next page)*	**Positive Association for Overweight/ obesity in the Study Population** **Positive Association for Nutrition in the Study Population** Study design = Association Intervention duration = Not applicable Effect size = Positive association for overweight/ obesity and nutrition in the study population	**Maintenance** Not Applicable No intervention implemented **Sampling / Representativeness** High The School Nutrition Dietary Assessment-III sample was designed to be representative of all public school food authorities participating in the NSLP, school in those school food authorities and students in grades 1-12 in those schools.

(Continued from previous study)				
		19. Attending a middle school with no pouring rights contract was estimated to reduce consumption of sweetened beverages by 16 kcal/school day ($p<0.05$) or, with a la carte but no low-nutrient, energy-dense items, by 26 kcal per school day, or with no a la carte, by 52 kcal ($p<0.001$). 20. Attending an elementary school that did not offer french fries (or similar potato products) at least once weekly was estimated to reduce low-nutrient, energy-dense food consumption by 43 kcal/ school day ($p<0.01$). In elementary schools that offered daily fresh fruit or raw vegetables, children consumed 36 kcal less of low-nutrient, energy-dense foods ($p<0.05$). 21. Results for middle school suggest that offering no low-nutrient, energy-dense foods a la carte was positively related to vegetable intake (excluding french fries) (0.12-c equivalents, $p<0.05$) 22. In high schools, not having an open campus policy was estimated to increase in-school consumption of vegetables (excluding french fries) by 0.06-c equivalents ($p<0.001$). Environment change results reported in the intervention table		

Study Description	Measures & Outcomes	Effect Size or % Change	Effectiveness	Maintenance & Representativeness
Author Hannan, French (2002) Location not reported **Design** Association Cross-sectional study **Duration** Not Applicable Only cross-sectional data provided	**Measures** *Access to affordable, healthy foods* (presence of price increases in high-fat foods and decreases in lower-fat foods at schools) **Outcome(s) Affected** Food sales (sales data)	**Not Reported (for desired health outcomes)** **Positive Association for Purchasing Behavior in the Study Population (School Food and Beverage Policies)** **School Food and Beverage Policies** PURCHASING BEHAVIOR: 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.	**More Evidence Needed** Study design = Association Effect size = Not reported	**Maintenance** Not Applicable **Sampling / Representativeness** Not Reported

IMPACT TABLES

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
School Meal Policies - United States						
Author Perry, Bishop (2004) Minnesota	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High 26 schools from one large school district in the Twin Cities metropolitan area of Minnesota were included in the intervention. 13 schools received the intervention and 13 served as the delayed-program group and received training and materials at the end of the active study phase. **High-Risk Population** Not Reported (for intervention population) 5-10 year olds	**Representative** High 13 schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Complex School policy adding an additional serving of fruit and/or vegetable in the lunch line and snack cart COMPLEX: 1. 2 week kick-off campaign featuring life size fruit and vegetable characters on posters in cafeteria. 2. Monthly samplings of fruits and vegetables 3. Annual challenge week competition encouraging students to eat 3 servings of fruits and/or vegetables per day during lunch. 4. Theater production regarding fruit and vegetable consumption 5. Verbal encouragement from lunch room staff **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, promotional activities, monthly sampling, challenge week, theater production Specialized expertise: 1-day training for school food service staff and cook managers; monthly meetings (year 1) and quarterly meetings (year 2) with cook managers Resources needed: Funding for additional fruit and vegetables (lunch and monthly samplings), posters, incentives, funding and personnel for trainings, materials for theater production Cost: Not reported **Implementation Complexity** High Intervention components= Complex Feasibility = High	**Population Impact** High Impact for Nutrition in Study Population Effectiveness = Effective for nutrition in study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness = Not reported for high-risk populations Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Reported	Not Reported	1. Verbal encouragement by food service staff in the lunch line was significantly associated with fruit and vegetable consumption (no potatoes, no juice) at follow-up (r^2=0.40; regression coefficient= 0.64, p=0.001), fruit and vegetable consumption (no potatoes) at follow-up (r^2= 0.26; regression coefficient= 0.52, p=0.007), fruit consumption (no juice) at follow-up (r^2= 0.24; regression coefficient= 0.49, p=0.011) and increased consumption of fruits and vegetables (no potatoes, no juice) from baseline to follow-up (regression coefficient= 0.34). 2. Number of fruits and vegetables on the snack cart was associated with increased fruit and vegetable consumption from baseline to follow-up (r^2=0.45; regression coefficient= 0.53, p=0.001). 3. Intervention schools had greater verbal encouragement from food service staff than control schools (42% of observations vs. 11% of observations, p=0.01) and more fruits and vegetables that students could choose (mean= 4.37 vs. mean= 3.89, p<0.001).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Lytle, Kubik (2006); Klein, Lytle (2008); Story, Lytle (2002); Birnbaum, Lytle (2002); Lytle, Murray (2004); Lytle, Gerlach (2001); Lytle, Perry (2001); Kubik, Lytle (2003) Minneapolis/St. Paul, MN TEENS study	**Participation/ Potential Exposure** Participation = Not reported Exposure = High 33 schools were eligible to participate and 16 schools agreed and schedules allowed them to participate. 4050 7th grade students were exposed to the intervention (at least partially). **High-Risk Population** Not Reported (for intervention population) Urban 11-18 year olds 68.7% White, 10.4% African American, 6.9% Asians or Pacific Islanders, 5.6% multi-racial, 8.5% other racial/ethnic groups, 19.8% lower-income (evaluation sample)	**Representative** High All seventh graders from 16 schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Multi-Component School policy increasing offerings of fruits, vegetables and low-fat snacks <u>MULTI-COMPONENT:</u> 1. School nutrition advisory councils <u>COMPLEX:</u> 1. Classroom curriculum component using peer leaders (7th grade curriculum only) 2. Family newsletters **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, advisory councils, peer-led classroom curriculum, family newsletters Specialized expertise: One-day training for teachers, training for peer-leaders Resources needed: Peer-leader manuals, materials for peer-leader and teacher trainings, newsletters, behavioral coupons, materials (e.g., videos, comic strips, snacks) for classroom activities, funds for additional fruits, vegetables and low-fat snacks Cost: Not reported **Implementation Complexity** High Intervention components= Multi-component Feasibility = High	**Population Impact** High Impact for Nutrition for the Study Population Effectiveness = Effective for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness = Not reported for high-risk populations Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Yes TEENS 7th grade curriculum has been placed on a website for wide dissemination.	Not Reported	1. Parents whose children received the intervention were more likely to select the lower fat choice from the shopping pairs in comparison with parents of children who did not receive the intervention (p=0.01).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Reynolds, Franklin (2000); Reynolds, Franklin (2000); Reynolds, Raczynski (1998); Harrington, Binkley (1997) Alabama	**Participation/ Potential Exposure** Participation = High (100%) 2456 third grade students were eligible to participate in the High 5 project. All 2456 parents passively consented to their child's participation in the intervention activities. 100% of the 28 schools and 108 classroom teachers that were eligible participated in the intervention. Exposure = Not reported **High-Risk Population** Not Reported (for intervention population) 50% parents 50% 5-10 year olds 83% European American, 16% African American, 1% other race/ethnicity (evaluation sample)	**Representative** Not Reported **Potential Population Reach** More Evidence Needed Participation = 100% Representativeness = Not reported Exposure = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = Not reported	**Intervention Components** Complex School policy to offer at least 10 fruit and vegetable servings per week, modify recipes to meet 5 a Day guidelines and offer salad bar and pre-plated salads COMPLEX: 1. 14-lesson classroom curriculum 2. Kick-off night for parents 3. Freggie book (homework assignments, skill-building materials) 4. Newsletter to parents 5. Food cues in the lunchroom to identify fruits and vegetables 6. High 5 days – students challenged to eat 5 servings of fruits and vegetables that day **Feasibility** Intervention Feasibility = Low Policy Feasibility = Low Intervention activities: School lunch changes (3), classroom curriculum, kick-off night, parent homework, parent newsletter, food cues in the lunchroom, High 5 day student challenges Specialized expertise: Trained Curriculum Coordinators Resources needed: Classroom curriculum, resources for kick-off night, Freggie homework books, Star Rating certificates, Curriculum Coordinators, parent newsletters, promotional materials, food cue signs, funds for additional fruits and vegetables and salad bars Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = Low	**Population Impact** More Evidence Needed Effectiveness = Effective for nutrition in children Potential population reach = More evidence needed Implementation complexity= High **High-risk Population Impact** More Evidence Needed Effectiveness = Not reported for high-risk populations Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Reported	Not Reported	1. There were no differences between conditions for parent consumption at follow-up 2 (p=ns).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Perry, Bishop (1998); Story, Mays (2000) Minnesota	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High 1750 fourth-grade students enrolled in the 20 participating inner-city public schools in St. Paul, MN (10 intervention, 10 delayed program) received the intervention. **High-Risk Population** High Urban, 5-10 year olds Nearly half of the students in the school district are of non-Caucasian ethnic backgrounds. 48% White, 25.2% Asian American, 19.1% African American, 6.4% Hispanic, 1.3% Native American, >60% students received free or reduced-cost school lunch (intervention sample)	**Representative** Low All fourth-graders in 10 schools were exposed. **Potential Population Reach** Low Exposure = High Representativeness = Low Participation = Not reported **Potential High Risk Popluation Reach** Low High-risk population = High Representativeness = Low	**Intervention Components** Complex School policy to increase the variety and choice of fruits and vegetables served and offer an additional fruit choice on days when baked or frozen desserts are served COMPLEX: 1. Classroom curricula (including taste testing) 2. Point-of-purchase promotions 3. Incentives for students who ate 2 or more servings of F&V at school 4. Family activity packets & snack packs 5. Local producer presentations **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, classroom curricula, point-of-purchase promotions, student incentives, family activity packets and snack packs, partnership with local producer to provide fruits and vegetables to school, local producer presentations Specialized expertise: 1-day training for teachers and 2-hour training session for food service staff Resources needed: Incentives, funds for additional fruits and vegetables, promotional materials, substitute teachers for teach trainings, classroom curriculum, local fruit and vegetable producers Cost: Not reported **Implementation Complexity** High Intervention components= Complex Feasibility = High	**Population Impact** Low Impact for Nutrition in the Study Populuation Low Impact for Nutrition in Girls No Impact for Nutrition in Boys Effectiveness = Effective for nutrition in the study population and in girls, not effective for nutrition in boys Potential population reach = Low Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness = More evidence needed Potential high-risk population reach = Low Implementation complexity = High **Sustainability** Yes The school district has provided Power Plus for all grade 4 teachers for the 3 years since the study ended (179 classes, 4,763 students).	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Bartholomew, Jowers (2006) Texas	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All students from two central Texas elementary schools (K-5) were exposed to the school lunch changes (n=1298). **High-Risk Population** High Lower-income, Hispanic, 5-10 year olds 73.4% Hispanic, 18.9% White, 6.1% African American and 1.6% other; 73.9% free or reduced-price lunch (intervention sample) Control school: 63.5% Hispanic, 28.3% White, 6.7% African American and 1.3% other; 60% free or reduced-price lunch (entire school)	**Representative** High All students from two schools were exposed. **Potential Population Reach** High Participation = Not reported Representativeness = High Exposure = High **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Simple School food policies to reduce high-fat food choices. SIMPLE: *Phase 1:* Food service increased the frequency of days offering at least one lower-fat entrée (<30% of energy from fat). *Phase 2:* Food service staff reduced the available high-fat entrée choices from three down to two each day **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes Specialized expertise: Dietitian to determine fat content in lunch entrees Resources needed: Dietitian, resources for determining fat content of existing entrees Cost: Not reported **Implementation Complexity** Low Intervention components = Simple Feasibility = High	**Population Impact** More Evidence Needed Effectiveness = Not reported Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness =More evidence needed Potential high-risk population reach = High Implementation complexity = High **Sustainability** Not Reported	Not Reported	1. Mean of 319 children selected a school lunch at the intervention school prior to the intervention. A mean of 446 and 472 children selected the school lunch during Phase 1 and Phase 2, respectively. Participation in school lunch increased slightly from pre-intervention to post-intervention.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Burgess-Champouxt, Chan (2007) Minnesota	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All 4th and 5th grade students (except for 5th grade band students due to scheduling conflicts) from 1 suburban elementary school in Minneapolis (intervention school) were exposed to the intervention. **High-Risk Population** Not Reported (for intervention population) Intervention group: 6.4% Hispanic, 3.2% Asian, 17.5% Black, 47.6% White, 9.5% American Indian, 23.8% other (evaluation sample) Control group: 6.1% Hispanic, 6.1% Asian, 4.9% Black, 75.6% White, 6.1% American Indian, 7.3% other (evaluation sample)	**Representative** Low All fourth and fifth grade students from one elementary school were exposed. **Potential Population Reach** Low Exposure = High Representativeness = Low Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = Low	**Intervention Components** Complex School policies replacing refined-grain products with whole-grain products in school cafeterias COMPLEX: 1. 5 lesson classroom curriculum consisting of 45 minute weekly lessons to improve knowledge and self-efficacy to identify and choose whole-grain foods 2. Weekly parent newsletters 3. Bakery and grocery store tours; "whole grain day" at a local milling museum **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, classroom curriculum parent newsletters, bakery/grocery store and museum tours Specialized expertise: One-hour training session for food service staff, school district nutritionist Resources needed: School district nurtitionist, personnel to train food service staff, incentives ($10-50 for participation), curriculum workbooks, flash cards, treasure maps, newsletters, funding to offset additional costs associated with menu changes, funds for whole-grain products, funding for events Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** Low Impact for Nutrition in the Study Population Effectiveness = Somewhat effective for nutrition in the study population Potential population reach = Low Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Applicable Pilot efficacy study	Not Reported	1. Pre/post changes in role-modeling (mean increase = 2.2 for intervention vs. 0.6 for control, P<0.001) and enabling behaviors (mean increase = 2.8 for intervention vs. 1.3 for control, P<0.05) were significantly greater for the intervention school than for the control school. 2. Self-reported parent intake of refined-grain decreased in intervention vs. control parents (-0.3 vs. 0.1, p<0.01).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Nucci, Stuhldreher (2003) West Virginia and Pennsylvania	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High There was a total of 274 West Virginia students (intervention school) and 419 Pennsylvania students (control school) enrolled in the 6th grade. (Note: It is likely the whole school was exposed to this intervention as it was a school lunch change. However, enrollment for the whole school was not reported.) **High-Risk Population** Not Reported (for intervention population) 70% of the students in the 2 counties received free or reduced-price meals. - not specific to the intervention population.	**Representative** High 61% of sixth-grade students from two West Virginia schools provided dietary recall (n=169 out of 274 enrolled). Because this was a lunch-time initiative it is probable most children eating school food were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Simple School nutrition policies implementing the West Virginia (WV) standards for school nutrition (details of the intervention not reported) **Feasibility** Intervention Feasibility = High Policy Feasibility = High Little information was provided on what school lunch changes occurred [e.g., bringing in new foods that met the dietary guidelines, changing existing food practices to lower fat and calories] and therefore feasibility may be lower depending on the intervention activities. Intervention activities: School lunch changes Specialized expertise: Not reported Resources needed: Not reported Cost: Not reported **Implementation Complexity** Low Intervention components = Simple Feasibility = High	**Population Impact** High Impact for Nutrition in the Study Population High Impact for Nutrition in Females Effectiveness = Effective for nutrition in the study population and females Potential population reach = High Implementation complexity = Low **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = Low **Sustainability** Not Reported	Not Reported	<u>UNINTENDED NEGATIVE EFFECTS:</u> 1. The percentage of students in the WV after cohort that met the standard for vitamins and minerals (except vitamin C), dropped. 2. Fewer than 25% of the WV after cohort met the standards for vitamin A, thiamin, vitamin B6, calcium, iron and zinc. The frequency of those compliant for these nutrients dropped and this decrease was disturbing, especially for iron (34% to 7%), zinc (22% to 3%) and thiamin (62% to 20%). 3. Caloric intake was lower for the WV after cohort and was less than the standard. 4. There were lower levels of cholesterol in the WV after cohort (from 76.2±31.9mg to 54.0±20.0mg, $p<0.001$ males; from 61.1±56.0mg to 37.0±29.0mg, $p<0.01$ females).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Slusser, Cumberland (2007) California	**Participation/Potential Exposure** Participation = Not Reported Exposure = High 3 schools in the Los Angeles Unified School District were exposed to the lunch salad bar. Approximately 700,000 students attend schools in the Los Angeles Unified School District. **High-Risk Population** Not Reported (for intervention population) Urban, Lower income, 7-11 year olds Approximately 25% Hispanic, 34.4% African American, 37.5% Asian, 1% Other, and 2.1% Unknown All of the children in the 3 schools were eligible to participate in the free or reduced-price lunch program (evaluation sample)	**Representative** High All second through fifth grade students attending three schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Multi-Component School policy introducing a salad bar to the school lunch MULTI-COMPONENT: Field trips to a farmers' market and/or a farm COMPLEX: 1. Children's artwork to advertise the program 2. All-school assembly to teach proper etiquette of serving salad and picking a well-balanced lunch **Feasibility** Intervention Feasibility = Low (high up-front costs, but maintenance costs lower) Policy Feasibility = High Intervention activities: School salad bar, field trips, promotional artwork, all-school assembly Specialized expertise: Not reported Resources needed: Funding for the salad bar (fruits, vegetables, lean protein), materials for school assembly and field trips, materials for children's artwork Cost: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = High	**Population Impact** High Impact for Nutrition in Study Population Effectiveness = Effective for nutrition in study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Yes Los Angeles Unified School District school board voted positively on an Obesity Prevention Motion in 2003 that includes recommending fruit and vegetable bars as a modification of the hot lunch program.	Not Reported	Not Reported
Author Gleason, Suitor (2003) United States	**Participation/Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided 6-18 year olds NSLP participants: 60% non-Hispanic White, 18% non-Hispanic Black, 17% Hispanic, 5% Other, 47% lower-income (≤185% of poverty) NSLP non-participants: 74% non-Hispanic White, 12% non-Hispanic Black, 10% Hispanic, 4% Other, 32% lower-income (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided Access to healthy lunch options at school: National School Lunch Program (NSLP) **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
School Meal Policies - International						
Author Haerens, Deforche (2006); Haerens, De Bourdeauduij (2007); Haerens, De Bourdeauduij (2006); Haerens, Cerin (2007); Haerens, Cerin (2007); Haerens, Deforche (2006) Belgium	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High 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. **High-Risk Population** Not Reported (for intervention population) 11-18 year olds 68% lower income (evaluation sample)	**Representative** Not Reported **Potential Population Reach** More Evidence Needed Exposure = High Representativeness = Not reported Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = Not reported	**Intervention Components** Multi-Component School policy to increase healthy food choices by: 1. Offering fruit for dessert during lunch 2. Pricing water lower than soft drinks 3. Selling fruit at school for a very low price or for free at least once a week 4. Offering water for free through drinking fountains <u>MULTI-COMPONENT:</u> 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. <u>COMPLEX:</u> 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 **Feasibility** Intervention Feasibility = Low Policy Feasibility = Low Intervention activities: Changes in food prices, offering addiitonal fruit at school, physical activity breaks, provision of extra sports materials, computer-tailored classroom lessons (physical activity and health eating), interactive parent meetings, parent newsletters, computer-tailored lessons for parents Specialized expertise: Development of a workgroup to guide intervention delivery Resources needed: computers, CD-ROM for the adult computer intervention, sports materials (jump ropes, balls etc.), funds for subsidizing fruit and water, materials for meetings with parents, newsletters for parents Costs: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = Low	**Population Impact** More Evidence Needed Effectiveness = Effective for overweight/obesity in the study population and girls, not effective for overweight/obesity in boys, effective for nutrition in the study population and girls, not effective for nutrition in boys, effective for physical activity in the study population and girls, not effective for physical activity in boys Potential population reach = More evidence needed Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness = Not reported for high-risk populations Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Reported	**Provision of Drinking Water** <u>OVERWEIGHT/OBESITY:</u> *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. <u>NUTRITION:</u> *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)*	Not Reported

(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 ave. of 21 min daily in the intervention with parent group and decreased by 57 min on ave. 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 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.

School Physical Activity Policies

OVERWEIGHT/OBESITY:

After Two Years

1. For girls there was a significantly lower increase in BMI in the intervention with parent group (from 20.23 ± 3.95 to 21.34 ± 3.83), compared to control (from 19.12 ± 3.50 to 20.78 ± 3.66, F=12.52; p<0.05).
2. For girls there was a significantly lower increase in BMI z-score in the intervention with parent group (from 0.24 ± 1.11 to 0.24 ± 1.06), compared to control (from -0.03 ± 1.05 to 0.14 ± 1.00; F=8.61, p<0.05).
3. There was a significantly lower increase in BMI z score in the intervention with parent group (from 0.24 ± 1.11 to 0.24 ± 1.06), compared to intervention no parent group (from 0.28 ± 0.97 to 0.35 ± 0.96; F= 2.68, p=0.05).
4. In boys, no significant positive intervention effects were found.
5. 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.

PHYSICAL ACTIVITY:

After One Year

6. Based on the physical activity questionnaire, the intervention with parent group increased their total physical activity by 9.0 min per day more than the control group (95% CI: 2.9, 15.2; p=0.004).
7. 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).
8. 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.
9. Based on the physical activity questionnaire, significant differences were 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.
10. Based on accelerometry data, MVPA increased an average of 4 minutes per day in the intervention with parent group, and decreased 7 minutes per day in the control group (F=5.1, p≤ 0.05; d=0.46).
11. Based on accelerometer data, PA of light intensity decreased an average of 21 minutes per day in the intervention with parent group and decreased 57 minutes on average per day in the control group (F=5.1, p≤ 0.05; d=0.54).

After Two Years

12. 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).
13. 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).
14. 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).
15. In girls, time spent in physical activity of light intensity decreased significantly less in the intervention groups (-2 min/day) compared with controls (-20 min/day; F=4.6, p<0.05).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Bayer, von Kries (2009) Germany	**Participation/Potential Exposure** Participation = Not Reported Exposure = High All children at the intervention schools were exposed to the intervention. **High-Risk Population** Not Reported (for intervention population) 3-6 year olds (target population)	**Representative** High All children at the intervention schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Multi-component TigerKids Intervention - Provided at least 30 min/day vigorous physical activity. MULTI-COMPONENT: 1. School policy for kindergartens to replace high energy density snack foods and sugared beverages with fruits and vegetables, water and non-sugared drinks. COMPLEX: 1. Parent materials, newsletters and "TippCards" 2. An internet platform with supporting information was established for teachers and families. 3. Teachers provided with materials and modules for Kindergarten and a CD with songs for use in the day cares. **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: Nutrition guidelines for snacks/meals served to children, 30 min/day of physical activity, parent promotional materials, internet platform with supporting information Specialized expertise: 2-day teacher training workshop to learn about implementation of the TigerKids intervention Resources needed: Materials, folder, and CD for Kindergarten teachers, newsletters, TippCards, web staff, telephone hotline personnel Costs: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = High	**Population Impact** High Impact for Nutrition in the Study Population Effectiveness = Effective nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Reported	**School Physical Activity and Environment Policies** PHYSICAL ACTIVITY: 1. Intervention students in the first sample had a significantly higher number of side to side jumps than control students (24.9, 95% CI: 24.4-25.3 vs. 24.0, 95% CI: 23.4-24.6; p=0.0056).	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Marcus, Nuberg (2009) Sweden	**Participation/Potential Exposure** Participation = Not Reported Exposure = High All students at the 5 intervention schools were exposed to the intervention. **High-Risk Population** Not Reported (for intervention population) 6-10 year olds (target population)	**Representative** High All students at the 5 intervention schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High **Potential High Risk Popluation Reach** More Evidence Needed High-risk population - Not reported Representativeness = High	**Intervention Components** Multi-component STOPP study- Physical activity: Teachers increased non-sedentary behavior in the classroom (goal = increase physical activity by 30 min/day); toys from home that encouraged sedentary behaviors were prohibited; students were not allowed to play computer games at the after school care center for more than 30 minutes. MULTI-COMPONENT: *School nutrition policies that included:* 1. Offering a variety of vegetables to students prior to the main course at school meals 2. Substitution of white bread with whole-grain bread, or a similar product 3. Reduction of sugary meals and snacks 4. Offering lower-fat milk options in place of high-fat products 5. Requiring low-fat sandwich ingredients COMPLEX: 1. Dietary component: Teachers encouraged children to increase vegetable intake. 2. Schools were encouraged to eliminate sweets including those brought from home. Parents were encouraged to not send sweets from home. 3. Newsletter twice a year for parents and school staff. 4. School nurses received education about obesity-related problems. **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School meal changes, increased physical activity in class (30 min/day), restrictions on use of sedentary toys, promotion of vegetables, elimination of sweets at school and brought from home, newsletter to parents and staff, educational material for school nurses Specialized expertise: School personnel met with research staff every term to increase their awareness of the intervention. Resources needed: Newsletter, educational material for school nurses, funds for healthier foods Costs: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = High	**Population Impact** High Impact for Overweight/obesity in the Study Population High Impact for Overweight/obesity in Boys No Impact for Overweight/obesity in Girls High Impact for Nutrition in the Study Population Effectiveness = Effective for overweight/obesity in the study population and boys, not effective for overweight/obesity in girls, and effective for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Reported	**School Physical Activity and Environment Policies** PHYSICAL ACTIVITY: 1. After adjustment for cluster of schools, there were no statistically significant differences between intervention and controls for levels of total physical activity and physical activity in after school care.	UNINTENDED POSITIVE RESULTS: 1. Researchers observed that families from the intervention schools reported healthier eating habits, which indicated that the change in attitudes and rules at school may have facilitated parental selection of healthier foods at home.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Sahota, Rudolf (2001); Sahota, Rudolf (2001) Leeds, United Kingdom	**Participation/Potential Exposure** Participation = Not Reported Exposure = High All children in the 5 intervention schools were exposed to the intervention. **High-Risk Population** Low 8-10 year olds The schools had 1 to 42% children from ethnic minorities and 7 to 29% entitled to free school meals, (compared with 11% and 25%, respectively, for Leeds children as a whole)	**Representative** High All children in the 5 intervention schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High **Potential High Risk Popluation Reach** Low High-risk population = Low Representativeness = High	**Intervention Components** Multi-component APPLES program (Active program promoting lifestyle education in schools) that promoted physical activity through formal education 1. Developing and implementing action plans to promote physical activity MULTI-COMPONENT: 1. School policies to promote healthy modification of school meals. 2. Development and implementation of school action plans to promote healthy eating **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School menu changes, school action plans increasing opportunities for physical activity and healthy eating Specialized expertise: Intervention team composed of a dietician, community pediatrician, health promotion specialist, psychologist, obesity physician and nutritional epidemiologist. The intervention teamed trained the teachers and provided resources and support. Resources needed: Dietitian, pediatrician, health promotion specialist, psychologist, nutritional epidemiologist, funds for conducting school action plans (i.e., playground facilities, etc.), funds for teacher training Costs: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = High	**Population Impact** No Impact for Overweight/ obesity in the Study Population High Impact for Nutrition in Study Population Effectiveness = Not effective for overweight/obesity and effective for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = Low Implementation complexity = High **Sustainability** Not Reported	**School Physical Activity and Environment Policies** PHYSICAL ACTIVITY: 1. No significant difference in amount of physical activity or sedentary behavior between intervention and control schools.	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Prell, Berg (2005) Sweden	**Participation/Potential Exposure** Participation = Not Reported Exposure = High Target population = adolescents (only included 8th grade as target) The intervention was conducted among all 8th grade pupils at 3 comprehensive schools (n=390) in the Goteborg area in Sweden **High-Risk Population** Not Reported (for intervention population) 14 year olds	**Representative** High All eighth grade students were exposed in the 3 schools. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Complex School lunch policies to increase access to healthy fish options COMPLEX: Home economics education component - 5 classroom cooking experiences **Feasibility** Intervention Feasibility = High Policy Feasibility = High Intervention activities: Changes to school lunch (increase avail. fish) and education Specialized expertise: 1-day training for food personnel Resources needed: Funds to train food personnel, funds to make menu modifications, fish-related decorations, curriculum for home economics class Cost: Not reported **Implementation Complexity** High Intervention components= Complex Feasibility = High	**Population Impact** Low Impact for Nutrition in Study Population Effectiveness = Somewhat effective for nutrition in study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Reported	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Ho, Gittelsohn (2008); Rosecrans, Gittelsohn (2008); Ho, Gittelsohn (2006) Canada	**Participation/ Potential Exposure** Participation = Not Reported Exposure = Low All intervention school students were exposed to the school lunch menu changes, but only 3rd and 4th grade students received the physical activity and education component. The community members that visited the stores were exposed to the shelf labels and promotional activities. **High-Risk Population** High 100% Native American/ Alaskan Native (intervention population) Intervention group average age = 40.3; Control group average age = 44.7	**Representative** Not Reported **Potential Population Reach** More Evidence Needed Exposure = Low Representativeness = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = High Representativeness = Not reported	**Intervention Components** Multi-component Zhiiwapenewin Akino'maagewin: Teaching to Prevent Diabetes (ZATPD) program - physical activity breaks during lessons <u>MULTI-COMPONENT:</u> 1. Schools were encouraged to adopt policy of no soda and chips in school and review breakfast and lunch programs for nutritional content <u>COMPLEX:</u> 1. Community component: mass media (e.g., posters, flyers, local access cable, radio), cooking demos and taste tests in band offices and community events (e.g., walking challenges, family fun nights) 2. Recipe cards, posters, newsletters and letters; 4 family action packs sent home over the year 3. Store component: Promotion of healthier alternatives through shelf labels, posters, flyers, and cooking demos or taste tests; managers encouraged to stock low-sugar, low-fat and high-fiber foods 4. 16 lessons in 3rd grade and 17 lessons in 4th grade promoting healthy eating and physical activity **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School menu changes, physical activity breaks, promotional activities in school (e.g., newsletter, posters), family action packs, store shelf-labels, promotional events in stores (e.g., taste tests, flyers), additional healthier items stocked in stores, mass media promotions in the community, community events (e.g., walking challenges, family fun nights) Specialized expertise: Field supervisor, project coordinator, trained program assistants from the community Resources needed: Physical activity lessons for breaks, school component resources (recipe cards, school newsletter, posters, letters, family action packs), resources for store component (shelf labels, posters, flyers, materials for cooking demos/ taste tests), posters, flyers and messages for mass media, materials for community cooking demos or taste tests, materials for community events (walking challenges, family fun nights), community program assistant, project coordinator, and field supervisor Costs: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = High	**Population Impact** More Evidence Needed Effectiveness = Not reported for general population Potential population reach = More evidence needed Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not effective for overweight/obesity and effective for nutrition in Native Americans Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Yes At the end of the program, most store owners agreed to continue stocking healthier foods, and some stated they would post shelf labels and posters if given the materials. All communities expressed a willingness to continue program activities if supplied with materials, but there was no plan made for such continuation.	**School Physical Activity and Environment Policies** <u>PHYSICAL ACTIVITY:</u> 1. Total activity counts decreased for both intervention and comparison, whereas minutes of sedentary activity increased for both groups. There were no significant differences in changes in minutes of light physical activity/ day, moderate physical activity/ day or vigorous physical activity/ day across the 2 groups even after adjustment for covariates.	<u>KNOWLEDGE AND AWARENESS:</u> 1. There were no significant differences between groups in the healthiness of food preparation score and food intention scores.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Parker, Fox (2001) England	**Participation/Potential Exposure** Participation = Not Reported Exposure = High Target population = secondary school children 1972 children from 2 secondary schools in Peterborough were exposed to the intervention. **High-Risk Population** Low Lower income, 11-18 year olds Intervention schools represent the highest (38%) & lowest (19%) proportion of Free School Meal Entitlement (FSME) pupils. Control school had FSME enrollment midway between intervention schools (23%). These schools reflect the socio-economic and ethnic profile of Peterborough's urban area.	**Representative** High All secondary school children in two Peterborough schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** Low High-risk population = Low Representativeness = High	**Intervention Components** Complex School policies to increase the availability of fresh fruit by a min. of 50%, the availability of vegetables and salad by a min. of 50%, the availability of high fiber bread by 100%, the availability of non fried potatoes by a min. of 66% and the availability of non cream cakes by a min. of 50% COMPLEX: 1. School food groups provided a forum for initiating positive changes in the food provision and eating environment within the school 2. Promotion of healthier foods (e.g., photo menu board to promote healthier combinations of foods, entertainment in lunch line) 3. Peer-related and curriculum activities-targeting drama in workshops and/or lessons on food and health. **Feasibility** Intervention Feasibility = Low Policy Feasibility = High (development and use of school food groups) Intervention activities: School lunch changes, school food groups, healthy food promotion, peer-related activities in drama class, health education lessons Specialized expertise: School food groups consisting of school staff, caterers and health professionals Resources needed: Funds for healthier foods, photo menu boards, supplies for food-tasting workshops, supplies for education lessons, supplies for competitions, supplies for a parents evening, equipment and foods purchased for launch and continuation of fast food area for healthier options, supplies for the production and performance of "The Food Show" Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** High Impact for Nutrition in Children Effectiveness = Effective for nutrition in children Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = Low Implementation complexity = High **Sustainability** Not Reported	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Ask, Hernes (2006) Norway	**Participation/Potential Exposure** Participation = Not Reported Exposure = Low Students in one 10th grade classroom in one secondary school in rural Norway received breakfast at school (n=26 students). **High-Risk Population** Not Reported (for intervention population) Rural 15 year olds Intervention: 15 males, 11 females Control: 14 males, 14 females (evaluation sample)	**Representative** Low Only students in one tenth grade classroom were exposed. **Potential Population Reach** Low Exposure = Low Representativeness = Low Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = Low	**Intervention Components** Complex School policy providing a daily breakfast (low fat milk, orange juice, whole grain bread, different spreads with fish, meat and cheese and a fruit) at school. COMPLEX: 1. Students offered a food supplement consisting of vitamins, minerals and omega-3 fatty acids. 2. Presentation for parents on the importance of breakfast and a packed lunch. 3. Students trained to use a data program to evaluate their own diet (month 1 and 4) **Feasibility** Intervention Feasibility = Low Policy Feasibility = High (adding additional meal, not changing existing service) Intervention activities: Provision of a healthy school breakfast, provision of a vitamin supplement, parent presentation, student diet evaluation training Specialized expertise: Not reported Resources needed: Food for breakfasts, personnel to prepare and serve breakfasts, data program for student diet evaluation, materials for parent presentation Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** No Impact for Overweight/ obesity in the Study Population No Impact for Overweight/ obesity in Girls No Impact for Overweight/ obesity in Boys No Impact for Nutrition in the Study Population No Impact for Nutrition in Girls Low Impact for Nutrition in Boys Effectiveness = Not effective for overweight/obesity in the study population, girls, and boys, somewhat effective for nutrition in boys, and not effective for nutrition in girls and the study population Potential population reach = Low Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Applicable Pilot study	Not Reported	1. Teachers reported improvement in school attention and social behavior among intervention group students; not statistically significant due to limited reporting by teachers. 2. School performance as measured by time spent doing home-work did not increase as a result of the intervention.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Shemilt, Mugford (2004); Shemilt, Harvey (2004) England	**Participation/Potential Exposure** Participation = Not Reported Exposure = High The United Kingdom Department of Health developed breakfast clubs in primary and secondary schools serving deprived areas across England. **High-Risk Population** High Breakfast clubs were only instituted in areas with high levels of deprivation. (target sample) 76% lower-income (evaluation sample)	**Representative** High Students from 30 primary and secondary schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Simple School breakfast club to provide a healthy breakfast to children before school. **Feasibility** Intervention Feasibility = Low Policy Feasibility = High (adding additional meal, not changing existing service) Intervention activities: Provision of breakfast before school Specialized expertise: Not reported Resources needed: Funds for healthy breakfast foods, personnel to prepare and serve the breakfasts Costs: Mean estimated total cost including costs associated with all resource inputs used to implement and maintain the breakfast club for 2 years was £9494 for a primary school-based club and £9728 for a secondary school-based club. **Implementation Complexity** Low Intervention components = Simple Feasibility = High	**Population Impact** High Impact for Nutrition in the Study Population Effectiveness = Effective for nutrition in the study population Potential population reach = High Implementation complexity = Low **High-risk Population Impact** High Impact for Nutrition in Lower-income Children Effectiveness for high-risk populations = Effective for nutrition in lower-income children Potential high-risk population reach = High Implementation complexity = Low **Sustainability** Not Applicable Pilot study	Not Reported	1. (N=758 and 754, respectively) Using intention to treat analysis, fewer secondary-aged students in the intervention group reported having skipped classes on at least 1 day within the last month (9% vs 16% AOR=0.47, 95%CI= 0.24-0.92) and having skipped at least 1 day of school within the last month (5% vs 14%, AOR=0.49, 95%CI= 0.25, 0.99) compared to students in the control group at second follow-up. Results were not significant using observational analysis. 2. (N=446 and 412, respectively) Using observational analysis, a higher proportion of primary-aged students who attended breakfast club had borderline or abnormal conduct (29% vs 10%AOR=3.93, 95%CI= 1.75, 8.82) and total difficulties scores (35% vs. 14%, AOR= 2.15, 95% CI= 1.02, 4.52) compared to non-attendees. 3. (N=305) Using observational analysis, a higher proportion of secondary-aged students who attended breakfast club had borderline or abnormal prosocial scores compared to non-attendees (41% vs 30%, AOR=2.68, 95%CI= 1.08, 6.61)

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Horne, Tapper (2004) London, England	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All 364 students from one inner-city London school were exposed to the intervention. **High-Risk Population** High Lower-income, 5-11 year olds Intervention school: 85% racial/ ethnic populations and 67% free-meal entitlement (intervention sample) Control school: 80% racial/ ethnic populations and 46% free-meal entitlement	**Representative** High The school that received the intervention (and the control school) had a much higher level of deprivation than the national average of 17% meals entitlement (targeting high-risk populations). **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Complex School policy providing fruits and vegetables to all children at lunchtime, and fruits to 5-7 year olds at snack time COMPLEX: 1. Six 6-min peer modeling videos featuring "Food Dudes" 2. Letters from Food Dudes read to children to provide encouragement and praise 3. Two home packs distributed to children (information for parents, charts for children to record F&V consumed at home) 4. Incentives for eating/tasting fruits and vegetables **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, snack time changes, videos, promotional letters, home packs, incentives Specialized expertise: Not reported Resources needed: Funds for additional fruits and vegetables, Food Dude videos, rewards for eating F&V, letters from Food Dude, home packs with info and charts, badges, wall charts Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** Low Impact for Nutrition in the Study Population Low Impact for Nutrition for 5-7 and 7-11 year olds in the Study Population Effectiveness = Somewhat effective for nutrition in the study population and specifically for 5-7 and 7-11 year olds Potential population reach = High Implementation complexity = High **High-risk Population Impact** Low Impact for Nutrition in Lower-income, Minority Children Low Impact for Nutrition in Lower-income, Minority Children, specifically 5-7 and 7-11 year olds Effectiveness for high-risk populations = Somewhat effective for nutrition in all lower-income, minority children, specifically 5-7 year olds and 7-11 year olds Potential high-risk population reach = High Implementation complexity = High **Sustainability** Not Reported	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Gatenby (2007) United Kingdom	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All primary and special school children in the city of Hull were provided free healthy school meals following the Caroline Walker Trust nutritional guidelines. **High-Risk Population** High Over 50% of the population in the area of Hull lives in neighborhoods among the 20% most deprived areas in England.	**Representative** High All primary and special school children in the city of Hull were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Simple Provision of free healthy school meals to primary school children adhering to the Caroline Walker Trust (CWT) nutritional guidelines: ≤21.1g total fat ≤6.8 g saturated fat ≥74.3g carbohydrate ≤16.3g sugar ≥8.5g fiber ≥8.5 g protein ≥ 3.5 mg iron ≥193 mg calcium ≥150 µg vitamin A ≥ 60 µg folate ≥11 mg vitamin C **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School meal changes Specialized expertise: Nutritionists to help develop balanced menus Resources needed: Foods that meet new Caroline Walker Trust nutritional guidelines, revised balanced menus, personnel (nutritionist, head teachers, food providers/cafeteria staff) Cost: Not reported **Implementation Complexity** High Intervention components = Simple Feasibility = High	**Population Impact** More Evidence Needed Effectiveness = More evidence needed Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = High Implementation complexity = High **Sustainability** Not Reported	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Saksvig, Gittelsohn (2005); Gittelsohn, Harris (1995); Hanley, Harris (1995) Canada	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All 3rd, 4th and 5th graders in the school were exposed to classroom curriculum, physical activity breaks and family and peer components. All students in the school were exposed to the school wide ban of high fat and high sugar snacks and the health breakfast snack program. **High-Risk Population** High 7-14 year olds 100% Native American	**Representative** High All 3-5 graders were exposed. **Potential Population Reach** High Exposure = High Representativeness = High **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Multi-component Sandy Lakes Diabetes Prevention Curriculum (adapted from CATCH and Kahnawake School Diabetes Prevention curricula) included brief physical activity breaks during the class curriculum <u>MULTI-COMPONENT:</u> 1. School wide ban of high fat and high sugar snack foods and adoption of healthy breakfast snack program that offered each kindergarten through 5th grade student a glass of 1% milk, fruit, cheese and rice cake. A healthy school lunch program was developed and tested, but never adopted. <u>COMPLEX:</u> 1. Family component: Parents/families received healthy eating/physical activity messages through local radio, information booths at parent teacher nights, and newsletters. 2. Peer component: opportunities for peers to act as role models (e.g., children's video cooking club) 3. Class curriculum component: taught in grades 3-5 for 45min/lesson for 16 weeks **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School ban on high fat and high sugar snacks, healthy breakfast snack program, classroom curriculum included physical activity breaks, promotional messages to families, peer role-modeling activities Specialized expertise: Not reported Resources needed: Newsletters, resources for peer component (e.g. cooking club videos), relationships with local media, materials for information booths, breakfast snacks (milk, fruit, cheese, rice cakes) Costs: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = High	**Population Impact** No Impact for Overweight/obesity in the Study Population No Impact for Nutrition in Girls High Impact for Nutrition in Boys Effectiveness = Not effective for overweight/ obesity in Native American children, not effective for nutrition in girls, effective for nutrition in boys Potential population reach = High Implementation complexity = High **High-risk Population Impact** No Impact for Overweight/obesity in Native American Children No Impact for Nutrition in Girls High Impact for Nutrition in Boys Effectiveness for high-risk population = Not effective for overweight/ obesity in Native American children, not effective for nutrition in girls, effective for nutrition in boys Potential high-risk population reach = High Implementation complexity = High **Sustainability** Yes Authorities overseeing the healthcare services of the first nations in Canada requested the curriculum to use in other communities.	**School Physical Activity and Environment Policies** <u>OVERWEIGHT/OBESITY:</u> 1. Mean BMI increased significantly between baseline (20.5, SD=4.3) and follow-up (21.5, SD=4.8, p<0.001). 2. Students who were obese at baseline had a greater mean change in BMI than students who were not (p<0.05). 3. Percent of body fat also increased significantly from baseline (29.8, SD=10.7) to follow-up (31.0 SD=10.8, p<0.001).).	<u>KNOWLEDGE AND AWARENESS:</u> 1. Knowledge about foods low and high in dietary fat increased for girls (5.5 vs. 7.0, p<0.001) and boys (5.2 vs. 7.1, p<0.001) and for students who were obese at baseline (5.9 vs. 7.6, p<0.001) and not obese at baseline (5.0 vs. 6.7, p<0.001). 2. The curriculum knowledge scale increased for girls (2.8 vs. 4.4, p<0.001) and for boys (2.9 vs. 4.6, p<0.001), for students who were obese at baseline (3.4 vs. 4.6, p<0.001) and for students who were not obese at baseline (2.6 vs. 4.5, p<0.001). 3. The dietary preference scall changed between baseline and follow-up for girls (2.9 vs. 3.6, p<0.003) and boys (2.2 vs. 2.9, p<0.002) and for students who were not obese at baseline (2.3 vs. 3.2, p<0.001). 4. Dietary self-efficacy change significantly for girls (18.6 vs. 20.4, p<0.05) and for boys (17.4 vs. 19.2, p<0.05) and for students who were obese at baseline (17.7 vs. 20.4, p<0.01).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Nelson, Lowes (2007) England	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided. 4-18 year olds	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable 2001 National Nutritional Standards requiring secondary schools to offer at least 2 items from each of the following food groups: • Starchy foods – at least 1 not cooked in oil • 1 portion of fruit • 1 portion of vegetables (excluding potatoes) • Fish at least 2 times per week • Red meat at least 3 times per week (and alternatives for vegetarians) Primary school guidelines: • ≤ 3 times per week of starchy foods cooked in oil • Fruit-based desserts at least 2 times per week • Meat at least twice (rather than 3 times) per week • Fish at least once (rather than 2 times) per week Caterers encouraged to provide: • Free drinking water • Drinking milk • Hot food, especially during the cold months **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	Not Reported	Not Reported
Author Veugelers, Fitzgerald (2005) Nova Scotia, Canada	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided 5-10 year olds	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. Presence of school healthy eating policies that offer healthier menu alternatives to reduce obesity and overweight **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Competitive Food Policies-United States						
Author Foster, Sherman (2008) Pennsylvania	**Participation/ Potential Exposure** Participation = High (83.3% of Schools; 69.5% ± 15.4% of Students) Exposure = High A total of 12 schools were eligible and approached to participate in the intervention; 2 declined and 10 were enrolled. The consent rate across the 10 participating schools was 69.5% ± 15.4% of students. **High-Risk Population** High Intervention schools had ≥50% of students eligible for free or reduced-price meals. Urban, Lower income, 5-13 year olds Intervention group: 44.33% Black, 22.43% Hispanic, 17.09% Asian, 10.68% White, 5.47% other (evaluation sample) Control group: 46.83% Black, 27.67% Asian, 14.17% White, 5.83% Hispanic, 5.50 other (evaluation sample)	**Representative** High Children in 10 middle schools were exposed. **Potential Population Reach** High Participation = 83.3% of schools; 69.5% ± 15.4% of students (high) Representativeness = High Exposure = High **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Complex School food policies: beverages limited to 100% juice, water and low fat milk; snacks allowed (per serving): <7 g of total fat, <2 g of saturated fat, <360 mg of sodium and <15 g of sugar COMPLEX: 1. Nutrition education (50hrs per student per year) 2. Social marketing 3. Family outreach: education through meetings, events, workshops and challenges **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School food policies, nutrition education, social marketing, family meetings/workshops, challenges Specialized expertise: Training for school staff in nutrition education (~10 hours per year) Resources needed: Personnel (school staff), funds for training, curricula and supporting materials, incentives Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** High Impact for Overweigh/obesity in the Study Population No Impact for Nutrition in the Study Population Effectiveness = Effective for overweight/obesity in the study population, not effective for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** High Impact for Overweight/obesity in Racial and Ethnic Minority Children High Impact for Overweight/obesity in African-American Children No Impact for Nutrition in Racial and Ethnic Minority Children Effectiveness for high-risk populations = Effective for overweight/obesity in racial and ethnic minority children and African-American children, not effective for nutrition in racial and ethnic minority children Potential high-risk population reach = High Implementation complexity = High **Sustainability** Not Reported	Not Reported	OTHER: 1. The intervention showed no evidence of an adverse impact with respect to a worsening body image or changes in the incidence, remission and prevalence of underweight. 2. After controlling for gender, race/ethnicity, age and baseline television watching, weekday television watching was 5% lower in the intervention group than in the control group (OR: 0.95; 95% CI: 0.93 to 0.97; p<.0001) after 2 years. 3. After controlling for gender, race/ethnicity, age and baseline inactivity, inactivity was 4% lower in the intervention group than in the control group (OR: 0.96; 95% CI: 0.94 to 0.99; p<.01) after 2 years. 4. Decreases in self reported amounts of physical activity were reported by students at intervention and control schools, with no differences between the two groups.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author French, Story (2004); Fulkerson, French (2004) Minnesota TACOS	**Participation/ Potential Exposure** Participation = High (80% of Schools) Exposure = High Of the 25 eligible schools, 20 agreed to participate. School enrollment ranged from 812 to 3157 students (median: 1731 students). **High-Risk Population** Low Suburban, 14-18 year olds Schools predominantly suburban, with average 14% non-white students and 9% eligible for free/ reduced price lunch.	**Representative** High Children in 10 secondary schools were exposed. **Potential Population Reach** High Participation = 80% of schools (high) Representativeness = High Exposure = High **Potential High Risk Popluation Reach** Low High-risk population = Low Representativeness = High	**Intervention Components** Complex Trying Alternative Cafeteria Options in Schools (TACOS), school policy to increase the availability of lower fat a la carte foods in secondary school cafeterias. COMPLEX: 1. Student groups implemented school promotional activities highlighting lower-fat foods available in the a la carte areas (i.e. taste tests, student choice self-assessments, media campaigns). **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, taste tests, student self-assessments, media campaigns Specialized expertise: Training for students on how to conduct promotional activities (e.g., taste tests, student choice self-assessments); training for graduate assistants to conduct/facilitate promotions; promotions coordinator Resources needed: TACOS staff, promotions coordinator, resources for adding lower fat a la care items, faculty advisors, peer promotional materials, student group incentives ($100-$300) Costs: Mean amount of financial incentives per school in was $418 (SD $276) in year 1 and $920 (SD $320) in year 2. **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** No Impact for Nutrition in the Study Population Effectiveness = Not effective for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = Low Implementation complexity = High **Sustainability** Not Reported	Not Reported	1. The percentage of total promotions conducted in intervention schools was associated with an increase in the percentage lower-fat food sales in Yr 1 (p=0.033), but not in Yr 2 (p=0.399). The duration of total promotions and the percentage lower-fat food sales were unrelated in Yr 1 (p=0.207), but significantly positively associated in Yr 2 (p=0.029).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Schwartz, Novak (2009) Connecticut	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All students from three middle schools in Connecticut were exposed to the intervention (new snack guidelines). **High-Risk Population** Low Intervention schools: 33% eligible for free or reduced-price meals; 63.2% White, 24.6% Hispanic, 8.5% Black, 3.4% Asian American and 0.3% American Indian Comparison schools: 37% eligible for free or reduced-price meals; 50.4% White, 23.8% Hispanic, 21.1% Black, 4.6% Asian American and 0.06% American Indian	**Representative** High All students in 3 schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** Low High-risk population = Low Representativeness = High	**Intervention Components** Simple Guidelines established by the Department of Education to provide healthier versions of snacks sold at school (e.g., beverages, salty snacks, sweet snacks). Guidelines included: 1. No more than 35% of calories from fat 2. No more than 10% calories from saturated fat 3. No more than 35% added sugar by weight 4. Limiting serving sizes **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: Changes to snacks offered at school Specialized expertise: Health professionals to develop guidelines Resources needed: Healthy snack foods, health professionals to guide development of guidelines, other resources needed for policy change Cost: Not reported **Implementation Complexity** Low Intervention components = Simple Feasibility = High	**Population Impact** High Impact for Nutrition in the Study Population Effectiveness = Effective for nutrition in the study population Potential population reach = High Implementation complexity = Low **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = Low Implementation complexity = Low **Sustainability** Not Reported	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Cullen, Thompson (2005) Texas	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided 11 - 13 year olds, 91% lower income 7 schools were predominantly African American, 10 Hispanic, and 6 mixed ethnicity (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. Portion size of snack bar items available to students (e.g., sweetened beverages, high-fat, salty and sweet foods) **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Reported	Not Reported	Not Reported
Author Vecchiarelli, Takayanagi (2006) California	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided. Study subjects for the LAUSD intervention implementation: School 1: 26.0% of students eligible for free/reduced meals School 2: 75.0% of students eligible for free/reduced meals 33.8% Hispanic, 31.7% White, 9.3% Asian, 6.2% African American, 2.3% Pacific Islander, 9% multiracial and 7.7% other (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. Los Angeles Unified School District (LAUSD) school nutrition policy banning sales of soft drinks and foods of limited nutritional value/ junk foods through vending machines and direct sales throughout the school day. Beverage guidelines: healthy beverages = fruit drinks with ≥ 50% fruit juice, drinking water, milk, and electrolyte replacement beverages Snack food guidelines: ≤ 35% of total calories from fat, ≤ 10% of total calories from saturated fat, ≤ 35% added sugar, and ≤ 600 mg of sodium per serving Serving sizes for snacks: 1.5 oz for snacks and sweets, 2 oz for cookies/cereal bars and 3 oz for bakery items or frozen desserts. **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Reported	Not Reported	1. Female students who reported an impact of the soda ban at home/ outside of school drank fewer of the banned items at home/outside of school than males students in the same group (67.6% vs. 41.4%; $X^2[2]=6.402$, p=0.041). 2. Male students who reported no impact of the junk food ban paid less attention to what they ate ($X^2[2]= 6.563$, p=0.038) and ate more of the banned snacks at school compared to their female counterparts within the same group ($X^2[2]=6.077$, p=0.048).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Neumark-Sztainer, French (2005) Minnesota	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided 14-18 year olds, 84.3% White, 4.6% Asian American, 2.5% Hispanic, 2.4% Black and 6.2% American Indian/other; 9% eligible for free or reduced price school lunch (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. Impact of school food environment and policies (e.g., vending machines, open/closed lunch policies). **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Reported	Not Reported	Not Reported
Comprehensive School Food Policies-United States						
Author Harrell, Davy (2005) Mississippi	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All students at one middle school in Scott County, Mississippi were exposed to the school-wide changes (fresh fruits and vegetables in school cafeteria, healthier items in the vending machines). Only the 5th graders received the classroom education and parent night activities. **High-Risk Population** High Rural, Lower income, 5-10 year olds (5th grade) Intervention school: 70% eligible for free or reduced-cost breakfast and lunch Control school: 81% eligible for free or reduced-cost breakfast and lunch	**Representative** High All students in one middle-school were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** High High-risk populations = High Representativeness = High	**Intervention Components** Complex School food environment modifications to add fresh fruits and vegetables in the school cafeteria and include healthier options in vending machines. COMPLEX: 1. Classroom educational sessions regarding cardiovascular risks once a month 2. Parent's night to educate the parents about heart healthy lifestyles 3. Poster contest **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, vending machine option changes, classroom education, parent's night Specialized expertise: Medical team (physicians, pharmacists, dietitians, exercise physiologists) to help teachers develop and deliver the classroom educational sessions. Resources needed: Health care personnel to deliver the classroom component, plastic food models, prizes for poster contest, materials for parent night, funds for additional fruits and vegetables in the cafeteria Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** No Impact for Overweight/ obesity in the Study Population Low Impact for Nutrition in the Study Population Effectiveness = Not effective for overweight/obesity and somewhat effective for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** No Impact for Overweight/ obesity in Lower-income Children Low Impact for Nutrition in Lower-income Children Effectiveness for high-risk populations = Not effective for overweight/obesity and somewhat effective for nutrition in lower-income children Potential high-risk population reach = High Implementation complexity = High **Sustainability** Not Reported	Not Reported	1. At baseline, 15% had "high" or "borderline" resting systolic blood pressure (BP) readings and 13% had "high" or "borderline" resting diastolic BP readings. Mean values decreased over time in both groups ($p<0.05$). 2. At baseline, 33% had total cholesterol concentrations classified as "high" or "borderline." These concentrations decreased significantly over time in the intervention group (-4% for high group and -8% for borderline high group, $p<0.05$).

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Blum, Davee (2007); Blum, Davee (2008); Davee, Blum (2005) Maine	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High Four high schools in the southern and central regions of Maine received the intervention. School enrollment was 855 ± 422 students. **High-Risk Population** Not Reported (for intervention population) 14-18 year olds, 97.8% White, 32.9% lower income exposed, 20% lower-income unexposed (evaluation sample)	**Representative** High Students from 4 high schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Complex School policy to provide low-fat, low-sugar (LFLS), and portion-controlled vending and a la carte items: food items ≤ 30% of total fat calories and ≤ 35% sugar; beverages nonfat or 1% low-fat milk, 100% juice, and water; portion sizes limited to 12oz. beverages (excluding water), 3oz. frozen desserts, 3oz. bakery items, 2oz. cookies, 1.25oz. snacks. COMPLEX: 1. School committee promoted changes (e.g., taste-testing of healthier foods, banners encouraging F&V consumption, visual demonstrations of the amounts of sugar & fat in foods.) 2. Cafeteria increased fresh fruit and vegetable availability. **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, taste tests, promotional activities (banners), demonstrations Specialized expertise: Intervention coordinator, trained project specialist, dietitian Resources needed: Project personnel (coordinator, dietitian, trained project specialist), Incentives for school ($1500/year), school liaison, promotional materials, funds for additional fruits and vegetables Cost: Not reported **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** High Impact for Nutrition in Girls High Impact for Nutrition in Boys Effectiveness = Effective for nutrition in girls and boys Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Yes A model vending and a la carte nutrition policy was developed by each school.	Not Reported	UNINTENDED POSITIVE EFFECTS: 1. By decreasing availability of SSB and diet soda, availability of milk and juice in the intervention schools increased. UNINTENDED NEGATIVE EFFECTS: 1. In 2 of the schools, students and faculty had adverse reactions to the a la carte program, specifically the removal of certain items, the perceived lack of food and beverage choices, and smaller portion sizes with similar costs.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Wojcicki, Heyman (2006) California	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All students in the San Francisco Unified School District (SAFUSD) were exposed to the school nutrition policy; approximate 2003-2004 enrollment was 59,000 students. **High-Risk Population** Not Reported (for intervention population) 5-18 year olds 859 students from the Aptos middle school were 21.2% African American, 34.9% Asian American, and 23.4% Latino (demographics not reported for the whole school district)	**Representative** High All students in the SFUSD were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Simple Improved nutrition standards for school food service in the San Francisco Unified School District (SFUSD): - Beverages: plain water, 100% fruit juice, no soda, caffeine or artificial sweeteners, 1% or fat free milk with no bovine growth hormone, max size 12 fl. Oz. - Food items: <30% calories from fat; <10% calories from saturated plus trans fat; <35% sugar by weight; >5% of basic nutrients in snacks; portion size limits on snacks, desserts **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes Specialized expertise: Task force (external) including parents, students, doctors and members of the board of education Resources needed: Personnel on the task force, nutrition committee, board of education approval, new food items/ ingredients to meet standards Cost: Not reported **Implementation Complexity** Low Intervention components = Simple Feasibility = High	**Population Impact** More Evidence Needed Effectiveness = More evidence needed Potential population reach = High Implementation complexity = Low **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = Low **Sustainability** Not Reported	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Cullen, Watson (2009) Texas	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High The TX statewide policy has the potential to impact 4.7 million children in 1,238 school districts. **High-Risk Population** High Lower income, 5-18 year olds The school districts were 51% eligible for free or reduced-price, 12% Black, 31% Hispanic, 56% White and 1% other	**Representative** High The Texas school policy was implemented throughout the state, so it can be assumed the entire target population of Texas school children received the intervention. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Simple 2004 Texas Public School Nutrition Policy - effective beginning in school year 2004-5, it restricts the portion sizes of high-fat and sugar snacks to < 200 kilocalories per serving package and sweetened beverages to 12 ounces or less, limits the fat content of milk offered to 1% or less, provides guidelines for the fat content of foods served, and sets limits on the frequency of serving high-fat vegetables such as french fries **Feasibility** Intervention Feasibility = High Policy Feasibility = High Intervention activities: National School Lunch Program menu changes Specialized expertise: Not reported Resources needed: Funds to provide lower fat and calorie food options Cost: Not reported **Implementation Complexity** Low Intervention components = Simple Feasibility = High	**Population Impact** More Evidence Needed Effectiveness = Not reported Potential population reach = High Implementation complexity = Low **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = High Implementation complexity = Low **Sustainability** Yes Implementation of the policy is monitored during periodic school food service reviews.	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Cullen, Hartstein (2007); Hartstein, Cullen (2008) California, North Carolina, Texas	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All 6248 students from the six schools were exposed to the school food nutrition policy. **High-Risk Population** High California: School 1 – 91% Hispanic, 7% African American, 1% White and 1% other; 97% free and reduced price meals School 2 – 48% Hispanic, 48% White, 1% Native American and 4% other; 55% free and reduced price meals North Carolina: School 1 – 50% African American, 25% Native American, 23% White, 1% Hispanic and 1% other; 75% free and reduced price meals School 2 – 49% African American, 49% White, 1% Native American, <1% Hispanic and <1% other; 57% free and reduced price meals Texas: School 1 – 88% African American, 10% Hispanic, 1% other and <1% White; 93% free and reduced price meals School 2 – 98% Hispanic, 1% White, <1% African American and <1% other; 94% free and reduced price meals	**Representative** High All students from the six schools were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Simple School food environment modifications to improve healthy food and beverage choices in vending machines, a la carte areas and cafeterias. Goal to reduce all regular chips serving size bags to ≤1.5 oz, increase lower-fat chip offerings by 25%, increase fruit and vegetable menu items ≥ 3/day, increase fruit and vegetable variety to ≥10 different items, increase lower fat entrees to ≥2 per week; offer 20oz. sized bottled water, limit sweetened beverages to ≤12 oz., turn off soda machines during meals **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch changes, turn off soda machines during meals Specialized expertise: Dietitians to work with foodservice directors and managers to implement food and beverage goals. Resources needed: Dietitians, information sheet on foodservice changes for teachers, food service staff, $3,000 incentive for each school to implement changes, NuMenu nutrient standard meal planning system Cost: Not reported **Implementation Complexity** Low Intervention component = Simple Feasibility = High	**Population Impact** More Evidence Needed Effectiveness = Not reported Potential population reach = High Implementation complexity = Low **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = High Implementation complexity = Low **Sustainability** Not Applicable Pilot study	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Grainger, Senauer (2007) Minnesota	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High The school food policy was implemented in all school cafeterias in the Hopkins School District (most innovations at the high school), which served about 9,000 students daily. **High-Risk Population** Not Reported (for intervention population) 14-18 years old 6.9% of students received free or reduced-price meals; 84.2% White, 7.2% Black, 5.0% Asian, 2.8% Hispanic and 0.8% Asian (evaluation sample)	**Representative** High All students in the Hopkins School District were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Complex School cafeteria modifications, which removed high-fat foods and snacks from the school cafeteria, eliminated soft drinks from vending machines and introduced home-made nutritionally-rich foods. COMPLEX: 1. Construction of a new food service kitchen and lunchroom area **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: School lunch modifications, elimination of soft drinks from vending machines; construction of new food service kitchen Specialized expertise: Food service director knowledgeable in increasing efficiency and productivity in the kitchen Resources needed: New food ingredients (e.g., organic, no trans fat), purchase of vending machines and healthier beverages, funds for construction of the food service kitchen and lunchroom area, food service director Cost: 1. Prices increased due to preparing foods from scratch and providing more fresh fruits and vegetables. The price at Hopkins High School of the NSLP meal was $2.05 in 2002-03, $2.30 in 2003-04, and $2.50 in 2004-05. 2. Capital expenditure to start the program was large, but variable costs such as labor did not increase substantially due to efficiency gains. These gains were a result of the food service director's experience in the private sector which led him to focus on increasing efficiency and productivity in the kitchens. **Implementation Complexity** High Intervention components = Complex Feasibility = High	**Population Impact** More Evidence Needed Effectiveness = More evidence needed Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = More evidence needed Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Yes The program demonstrated its financial viability and is able to operate on a revenue-neutral basis, not requiring a subsidy from the school district.	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Cullen, Watson (2006); Cullen, Watson (2008) Texas	**Participation/ Potential Exposure** Participation = Not Reported Exposure = High All Texas public school children were exposed to the statewide Texas Public School Nutrition Policy (unfunded mandate to promote a healthy school environment). **High-Risk Population** Not Reported (for intervention population) 11-18 year olds, 47% eligible for free/ reduced price lunch; 61% Hispanic, 34% White, 3% African American, 2% Asian/ other (evaluation sample)	**Representative** High All Texas public school children were exposed. **Potential Population Reach** High Exposure = High Representativeness = High Participation = Not reported **Potential High Risk Popluation Reach** More Evidence Needed High-risk population = Not reported Representativeness = High	**Intervention Components** Multi-Component Texas Public School Nutrition Policy: Restriction of portion sizes of high-fat and sugar snacks, sweetened beverages (≤12oz), and fat content (≤28g fat per serving no more than 2 times per week) of all foods served at school. Also sets limits on the frequency of serving high-fat vegetables (french fries) to 3oz per serving no more than 3 times per week. (Year 3) MULTI-COMPONENT: 1. Local school district policy removing snack chips, candy, and many desserts from all district middle school snack bars and removing vending machines from all district middle school cafeterias. (Year 2) **Feasibility** Intervention Feasibility = High Policy Feasibility = High Intervention activities: School lunch menu changes; removal of unhealthy foods from snack bars; removal of vending machines from cafeterias Specialized expertise: Not reported Resources needed: Not reported Cost: Not reported **Implementation Complexity** High Intervention components = Multi-component Feasibility = High	**Population Impact** High Impact for Nutrition in the Study Population Effectiveness = Effective for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** More Evidence Needed Effectiveness for high-risk populations = Not reported Potential high-risk population reach = More evidence needed Implementation complexity = High **Sustainability** Not Reported However, there was no indication that the statewide policy was rescinded.	Not Reported	1. The total number of students enrolled in the NSLP program increased about 200 per school (~20%) from year 1 to year 3. The number of students certified as eligible for free or reduced-price meals increased 45% between years 1 and 3. However, the number of free and reduced-price meals served increased by much greater percentages during this period - 77% and 127%, respectively - than would be expected by the 45% increase in those eligible.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Ritenbaugh, Teufel-Shone (2003); Teufel, Ritenbaugh (1998) New Mexico	**Participation/ Potential Exposure** Participation = Not reported Exposure = High All students in the high school classes of 1999 and 2000 were exposed to the intervention. **High-Risk Population** High 100% Native American	**Representative** High The intervention children at Zuni high schools. Students from 2 schools participated. **Potential Population Reach** High Exposure = High Representativeness = High Exposure = High **Potential High Risk Popluation Reach** High High-risk population = High Representativeness = High	**Intervention Components** Multi-component Zuni Diabetes Prevention Program included school policies to: replace sugary soft drinks with diet beverages in school vending machines; ban unhealthy snacks and sugary beverages from the wellness center; increase fruits and vegetables (F&V) and decrease fat in school lunches; provide palatable water in 5 gallon water coolers. MULTI-COMPONENT: 1. Creation of youth fitness center open during lunch and after school; new exercise equipment and climbing wall; sponsored classes, tournaments, and other activities. COMPLEX: 1. Diabetes prevention curriculum: 9 weeks of physical education (PE) class devoted to orientation to wellness center and diabetes prevention; biology and food service class learning units; new elective on diabetes prevention. 2. Posters, school announcements and radio PSAs 3. Social network component: Efforts to develop 3 supportive social networks; Teen Task Force (6-12 youth) **Feasibility** Intervention Feasibility = Low Policy Feasibility = High Intervention activities: Creation of a fitness center; providing water to students; providing fruits and vegetables at lunch; decreasing sugar sweetened beverages and snacks from the vending machines and wellness center. Specialized expertise: Not reported Resources needed: Not reported Cost: Not reported **Implementation Complexity** High Intervention coponents = Multi-component Feasibility = High	**Population Impact** High Impact for Nutrition in the Study Population Effectiveness = Net positive for nutrition in the study population Potential population reach = High Implementation complexity = High **High-risk Population Impact** High Impact for Nutrition in Native American Students Effectiveness for high-risk populations = Net positive for nutrition in Native American students Potential population reach = High Implementation complexity = High **Sustainability** Not Reported	**School Environment Policies** FACILITY USE: 1. Increased use of the wellness facility over the first 3 years of operation. 8.5% of the total high school student population used the wellness center per day in Yr 1, while 28% used it daily in Yr 3.	1. Fasting glucose levels varied little over the 3 years, with levels for most youth well within the normal range. 2. The fasting insulin levels for Zuni females and males showed a significant downward trend over 3 years both at the median (Coeff= -12, p=0.03 females, Coeff= -18, p<0.001 males) and at the 75th percentile (Coeff= -27, p<0.05 females, Coeff= -39, p<0.001 males). By Year 3, neither Zuni males nor females were different from the appropriate Anglo comparison group. 3. 30-min insulin levels for Zuni females and males showed downward trends at both the median (Coeff= -261, p<0.001 females, Coeff= -135, p=0.05 males) and the 75th percentiles (Coeff= -260, p<0.001 females, Coeff= -342, p<0.001 males) over the 3 years. However, at year 3 levels for Zuni females remained higher than Anglo girls. In year 3 Zuni males were not different from the Anglo males.

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Cullen, Eagan (2000) & Cullen, Zakeri (2004) Texas	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable 9-11 year olds School district students were 18% African American, 24% Mexican-American, 57% European American, 1% Asian. 24% were eligible for free and reduced lunch meals.	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicabled	**Intervention Components** Not Applicable National School Lunch Program (NSLP) in elementary and middle schools MULTI-COMPONENT: Snack bar availability for students in middle school **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	Not Reported	Not Reported
Author Kubik, Lytle (2005) Minneapolis/ St. Paul, Minnesota	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided 30% racial/ethnic populations; 20% participated in the free or reduced-cost lunch program (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. School food practices allowing food and/ or beverages in the classroom, snacks and/ or beverages in the hallways, food or food coupons as a reward/ incentive for students, classroom fundraising that includes food sales and school-wide fundraising included food sales **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Gonzalez, Jones (2009) Location not reported	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided 5-10 year olds 50% Male, ~60% White, 18% Hispanic, 11% African American, and 7% Asian; 50% lived in households with an income > $50,000; ~65% attended schools that were Title 1 eligible; 35% attended schools without 7th or 8th grade (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. Impact of school policy restricting the availability of snack foods in school. **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	Not Reported	Not Reported
Author Gordon, Crepinsek (2009); Gordon, Cohen (2009); Story (2009); Briefel, Wilson (2009); Condon, Crepinsek (2009); Fox, Dodd (2009); Briefel, Crepinsek (2009); Fox, Gordon (2009); Clark, Fox (2009); Gleason, Dodd (2009); Crepinsek, Gordon (2009) United States	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided Lower income 6-18 year olds 46% racial/ethnic populations (22% Hispanic) 29% eligible for free school meals 13% eligible for reduced price meals 18% families were food insecure (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. School Nutrition Dietary Assessment (SNDA) Study-III - National School Lunch Program (NSLP) and School Breakfast Program (SBP) **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	Not Reported	Not Reported

Study Description	Population	Reach	Intervention	Impact & Sustainability	Other Results	Related Benefits & Consequences
Author Hannan, French (2002) Location not reported	**Participation/ Potential Exposure** Not Applicable **High-Risk Population** Not Applicable Only cross-sectional data provided. 13% racial/ethnic populations, 8% lower income (evaluation sample)	**Representative** Not Applicable **Potential Population Reach** Not Applicable **Potential High Risk Popluation Reach** Not Applicable	**Intervention Components** Not Applicable Only cross-sectional data provided. Policy to target high fat foods in schools MULTI-COMPONENT: 1. 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. **Feasibility** Not Applicable **Implementation Complexity** Not Applicable	**Population Impact** Not Applicable **High-risk Population Impact** Not Applicable **Sustainability** Not Applicable	**Food Pricing** PURCHASING BEHAVIOR: 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.	Not Reported