The Community Guide

Nutrition: School-Based Programs Promoting Nutrition and Physical Activity (2003 Archived Review)

Table of Contents

Review Summary

Intervention Definition

School-based nutrition interventions are implemented in school settings to promote healthy nutritional attitudes, knowledge and behavior, including eating and physical activity among school-aged children and adolescents. The interventions may target food policy, environmental factors and/or nutrition education. Interventions may be directed at school administrators, food service staff, teachers, parents, or directly to students. Interventions may be delivered by regular classroom teachers or by special program instructors.

Summary of Task Force Finding

The Community Preventive Services Task Force finds insufficient evidence to determine the effectiveness of multicomponent school-based nutrition interventions in increasing fruit and vegetable intake and decreasing fat and saturated fat intake among school-age children.

About the Systematic Review

The Task Force finding is based on evidence from a systematic review conducted on behalf of the Task Force by a team of specialists in systematic review methods, and in research, practice, and policy related to promoting good nutrition.

Summary of Results

Forty-five reports in forty-one studies qualified for the systematic review.

- A wide variation was seen in:
  - Combinations of components (activities)
  - Length of study (< 3 months to 60 months)
  - Age of study population (K–12, median age 9.3 years; most students were in grades 3–5)
  - Length of follow-up period (55% immediate follow-up to 2% at 48 months)
- Results were measured in terms of behavioral outcomes including changes in intake of fruit and vegetables, fat, and saturated fat.
- Study outcomes were based on self-report of dietary intake, which is probably subject to reporting bias (e.g., social desirability—the possibility that answers may be influenced by what the respondent thinks is socially acceptable).
- Although reported changes were in the desired direction, they were small and are questionable because of the potential bias of self-reports.

Task Force Finding

Intervention Definition

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Task Force Finding (June 2003)*

The Community Preventive Services Task Force finds insufficient evidence to determine the effectiveness of multicomponent school-based nutrition interventions in increasing fruit and vegetable intake and decreasing fat and saturated fat intake among school-age children.

Supporting Materials

Summary Evidence Tables

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Arbeit ML **Year:** 1992 **Sample Size:** 870 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** Suburban **Setting:** • School: grades K-6, analyses in grades 4-5 **Mean Age:** nr **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** 58.0% **SES:** Mixed	**Intervention Theory:** Social learning model, the Precede model **Target Group:** Students, Teachers, Food Service**,** Family **Intervention Description:** Heart Smart program components included: (a) school lunch program with CV healthful food choices, reduced fat (to <30% total E intake), sat'd fat (<10%), Na (<5g/d) & sugar; (b) PE program to promote personal fitness and aerobic conditioning; (c) CV risk factor screening. Heart Smart targeted school environment, curriculum, school lunch and PE. There was also a staff development program to enhance program implementation and role modeling. **Comparison Group Intervention:** received CV risk assessment, an overview of CV physiology, the relation of lipids, adiposity and BP to CV health, and the effect of lifestyles on risk factor status **Intervention Duration:** 30 months **Post measurement:** immediately following intervention	**% change I - % change C** **Health knowledge** test: 9% **Physical activity**: run/walk time in minutes 4th grade boys 1.4% 4th grade girls -6.8% 5th grade boys -16.6% 5th grade girls -13.8% Authors report decrease in **systolic blood pressure** (-1.6 mm Hg) among children with improved run/walk time*. Report decrease in **skinfold thickness** (4.3 mm sub scapular, 2.8 mm triceps) among children with improved run/walk time*. Report significant increase in **HDL** among intervention group*: p<.05 (*No data available to compute effect size.)

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Auld GW **Year:** 1998 **Sample Size**: 1250 (20 I, 17 C classrooms) **Suitability of Design:** Least **Design:** Before/after design **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** School: Grade K - 5 **Mean Age:** nr **% Female:** 49.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 21.0% **SES:** Mixed	**Intervention Theory:** Social Cognitive Theory blended with philosophies of Piaget and Dewey **Target Group:** Students, Teachers, Family **Intervention Description:** Integrated Nutrition Project (1993-97): Classroom intervention linking Food Guide Pyramid to foods to other subjects (math, history, etc). Hands on food prep and eating activity. Goal setting and self assessment by children. Overall goal was 2 servings of fruits or vegetables consumed in the lunchroom. Parent taught lunchroom component - 6 mini lessons focused on increasing whole wheat, fruits and vegetables. Teachers paired with special resource teachers, training in role modeling, nutrition and self-efficacy. **Comparison Group Intervention:** Participated in evaluation **Intervention Duration:** 24 months (years 3 and 4 of longer intervention) **Post measurement:** immediate	**% Change I - % Change C** School cafeteria consumption Fruit servings 29% p<.001 Veg servings 37% p<.01 **Mean Difference (I-C)** Food knowledge 15% p<.001 Self-efficacy F&V 20% p<.05
Author: Baranowski T **Year:** 2003 **Sample Size:** 1578 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 4 **Mean Age:** 9.4 years **% Female:** 52.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 44.8% **SES:** nr	**Intervention Theory:** social cognitive theory **Target Group:** Students, Teachers, Family **Intervention Description:** Squire's Quest: 10 session interactive multimedia game, 25 min per session. Engaged participants to learn about including fruits, 100% juice and vegetables in diet, goal setting, recipes, how to ask for items. The game worked with baseline preferences of participant and covered various environments: school lunch and snackes, home meals, snacks, after school & parties. Kids set goals to reach 5-a-day. **Comparison Group Intervention:** used computers for pre and post assessments **Intervention Duration:** 1.25 months **Post intervention measurement interval:** At end of intervention	**Differences in intakes between treatment and control groups** Fruit 0.52, F=9.47, p=.002 100% juice 0.17, F=2.02, p=.156 Regular vegetables 0.24, F=10.6, p=.001 Total fruit, juice, vegetables 0.91, F=9.4, p=.002 High-fat vegetables 0.09, F=2.6, p=1.07 Total fruit, juice, vegetables including high-fat vegetables 1.01, F=11.7, p=.0007

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Baxter AP **Year:** 1997 **Sample Size:** 1594 **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 3 limitations	**Location:** United Kingdom **Urbanicity: nr** **Setting:** • School: Grade 7 &10 • Community wide **Mean Age: nr** **% Female:** nr **Race/Ethnicity:** nr **% White:** nr **SES: nr**	**Intervention Theory:** None stated **Target Group:** Students, Teachers, Other Staff, Administration, Food Service, Family, Community **Intervention Description:** The "Action Heart" project focused on community, work places, youth centers, and primary & secondary schools. High school intervention included: curriculum adapted from the "My Body" project (effects of smoking on health), peer-led health education, no smoking policies, ad hoc activities like healthy eating days, publicity, staff training, training & presentation of peer health educators; school initiatives to take steps to lower CHD risks; heart-health activities facilitated by AH staff; exposure to promo materials for events (t-shirts, posters, leaflets). Community intervention: workplace heart-health promo, policy changes; publicity; low-fat milk promo; family exercise initiatives. **Comparison Group Intervention:** routine school health resources to all schools **Intervention Duration:**33 months Follow-up Interval: 3 months	**% Difference I – C** Intake of: wholegrain bread 3% low fat spread -3% low fat milk 4% Exercise ≥ 3 X wk 4%
Author: Birnbaum AS **Year:** 2002 **Sample Size:** 4050 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** School: Grade 7 **Mean Age: nr** **% Female:** 49.6% **Race/Ethnicity:** White, Non-hispanic **% White:** 62.0% **SES:** Middle	**Intervention Theory:** Social cognitive theory & theory of planned behavio **Target Group:** Students**,** Teachers**,** Food Service**,** Family **Intervention Description:** TEENS (Teens Eating for Energy and Nutrition at School) Three interventions: Group 1 - Peer Leader activities + Classroom curriculum + Environmental Intervention, Group 2 - Curriculum, including parent packs + Environmental Intervention, Group 3 - Environmental Exposure. Group 4 - control (usual educational experiences). Classroom intervention was 10 curriculum session delivered by the teacher. Peer leadership component focused on assisting in delivering classroom intervention by leading small - group activities, and discussion sessions. Enviromental exposure focused on promotion of fruits and vegetables, increasing lower fat snacks, social marketing of healthful diet. **Comparison Group Intervention:** Usual educational opportunities **Intervention Duration:** 8 months **Post measurement**: immediate	**(% change I) – (% change C)** **BRFSS F & V servings/day:** Environ + Curr + Peer: 18% p<.05 Environ + Curr: 9% **Environ only: –8%** **Preference score for servings of low-fat food:** Environ + Curr + Peer: 10% p<.01 Environ + Curr: 10% p<.01 Environ only: 4%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Bush PJ **Year:** 1989 **Sample Size:** 1234 **Suitability of Design:** Greatest **Design:** Controlled before/after **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Urban, Washington, D.C. **Setting:** • School: Grade 4-6 **Mean Age:** 10.5 years **% Female:** 54.0% **Race/Ethnicity:** African-American or African descent **% White:** nr **SES:** Mixed	**Intervention Theory:** Social Learning Theory; PRECEDE Model **Target Group:** Students, Family **Intervention Description:** "Know Your Body" promotes cardiovascular risk reduction through values clarification, goal setting, modeling, rehearsal, feedback of screening results and reinforcement. Teacher delivered curriculum, two 45-minute periods per week beginning in grades 4-6 in 9 Washington D.C. public schools. Teachers trained by research staff, curriculum adherence monitored by observation and questionnaires. Annual personalized health screening conducted in fall of school year. 1st intervention group: students and parents received results; 2nd intervention group and control (no curriculum): only parents received screening results. Health newsletter for families, intervention implementation guided by community-parent advisory board, MD-clinical advisory board, and student advisory board to plan supportive activities; pre-intervention info letters to community physicians. **Comparison Group Intervention:** Personalized health screening results sent to parents **Intervention Duration:** 24 months **Follow-up Interval:** 12 months	**% change I - % change C** Ponderosity index 2.1% Fitness score -10% Tri Skinfold 4% Plasma cholesterol 3.6% Systolic BP -3.2% Diastolic BP -9.1% Knowledge score 11.3% Mean differences **(no data to compute % change):** health locus of contol -0.21 self esteem .17 healthy snacks 1.84 % fat kcal -.35 % sat fat kcal -.75 dietary chol mg/kcal –29.08

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Davis SM **Year:** 1995 **Sample Size:** 2018 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Rural Navajo schools in isolated rural setting; Pueblo rural but not isolated **Setting:** Schools: Grade 5 **Mean Age:** 10 years **% Female:** 50.0% **Race/Ethnicity:** Native American **% White:** 1% **SES:** nr	**Intervention Theory:** none stated **Target Group:** Students, Family, Community **Intervention Description:** The Southwest Cardiovascular Curriculum was taught to Navajo & Pueblo 5th graders for 2 hours a week for 13 weeks. The culturally sensitive curriculum aimed to increase knowledge and induce behavioral change in areas of cardiovascular health: exercise, nutrition , obesity, tobacco, habit change & social influences. Incorporated Native American traditions into lessons and elders from community taught cultural traditions; exercise & food prep (beans, chilies, squash, corn) which promote health. Families provided info on adapting home recipes to "heart healthy" dishes. Students interviewed elder family members about eating and exercise when they were growing up. **Comparison Group Intervention:** Standard curriculum **Intervention Duration:** 3.25 months **Post measurement:** 0.75 month	**(% change I) – (% change C**) Survey questionnaire: Self-reported increase in physical activity: 15% p<.001 Increased CV health knowledge test score: Navajo: girls 27% boys 32% p<.0001 Pueblo: girls 23% boys 25% p<.0001 Self-reported consumption of foods high in fat: Navajo: girls -14% p<.03 boys 4% Pueblo: girls –3% p<.01 boys 8% Self-reported consumption of food high in sat'd fat: Navajo: girls -37% boys -25% Pueblo: girls -3% boys 8% Self-reported consumption of salty foods: Navajo: girls -14% boys 4% Pueblo: girls -18% boys -17%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Dollahite J **Year:** 1998 **Sample Size:** 930 **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Rural **Setting:** • School: Grade K-5 **Mean Age: nr** **% Female:** nr **Race/Ethnicity:** African-American or African descent **% White:** 19.0% **SES:** Low	**Intervention Theory: S**ocial learning theory **Target Group:** Students, Teachers, Food Service, Family, Community **Intervention Description:** (1) Students: 1 classroom nutrition lesson/wk (Health Ahead/Heart Smart; Exploring the Food Guide Pyramid with Prof. Popcorn); 1 lunch menu change/wk to reduce fat & add f/v per focus group suggestions; posters in lunchroom promoting new menu items and positive nutrition messages; 5-A-Day grocery store tour (grades 4-5). (2) Parents: invited to attend lunch on days with new menus; nutrition ed in newslletter and materials given at food assistance sites. (3) Teachers: 1-d training on curriculum materials. (4) Food service: training sessions on changing menu to reduce fat and increase f/v. (5) Community: activities included grocery store demos, project booth at local festival, nutrition messages on signs. **Comparison Group Intervention:** Nutrition ed unrelated to this project occurred in both communities. **Intervention Duration:** 5 months **Follow-up Interval:**1 month	**% change I - % change C** Nutrition knowledge Median gain: 2-3 grade 2% 4-5 grade 9% Food choices/diet behavior intent 2-3 grade 0 4-5 grade gain reported p<.001 (data not provided to compute effect)
Author: Edmundson E **Year:** 1996 **Sample Size:** 96 schools 8565 students **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** nr **Setting:** • School: Grade 3-5 • Home or Family **Mean Age:** 8.75 years **% Female:** 50% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** nr **SES:** Middle	**Intervention Theory:** Social cognitive theory **Target Group:** Students, Administration,Food Service, Family **Intervention Description:** 96 schools participated in the CATCH program, which was implemented in 3rd grades in schools in CA, LA, TX and MN in 1991-1992 and continued through the 5th grade. 1/2 the schools were controls; the other half were divided into two intervention groups. Subgroup 1 received a health education curriculum, PE, a campus no-smoking policy and a school food-service intervention. Subgroup 2 also received a home-based intervention **Comparison Group Intervention:** Their schools' standard health education curriculum **Intervention Duration:** 2.5 months **Follow-up Interval:** 24 months	Insufficient data to compute % changes **Standardized mean differences**: Dietary intention 0.26 p<0.001 Usual food choice 0.23 p<0.001 Dietary knowledge 0.40 p<0.001 Food choice social reinforcement 0.45 p<0.001 Self-efficacy dietary 0.10 p<0.08 physical activity 0.10 p<.07 Only one significant effect noted between the "school-only" and the "school plus family" arms: school plus family scored higher on dietary knowledge (p<0.05)

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Ellison RC **Year:** 1990 **Sample Size:** 400 **Suitability of Design:** Moderate **Design:** Cross-over study **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Suburban **Setting:** • School: Private boarding high schools **Mean Age:** nr **% Female:** 48.0% **Race/Ethnicity:** White, Non-Hispanic **% White:**nr **SES:** nr	**Intervention Theory:** none stated **Target Group:** Students**,** Food Service **Intervention Description:** School food service workers were trained to alter the saturated fat content of prepared food items, while keeping the total fat content constant. Students aware that menu changes were occurring, but did not know which foods were modified. Modification of approximately two-thirds of the fat-containing food products served in the schools' dining halls. This intervention was implemented at one boarding school for the school year while the other acted as a control. The following year the intervention and control schools were reversed. **Comparison Group Intervention:** usual program, cross-over design **Intervention Duration:** 9 months **Follow-up Interval:** 8 months	**% Change I - % Change C** **Males** Total Calories -7 % Total fat -2% Fat as % kcal -2% Saturated fat -20% P/S ratio 81% **Females** Total Calories -7% Total fat -15% Fat as % kcal -8% Saturated fat -23% P/S ratio 47%
Author: French SA **Year:** 2001 **Sample Size:** 12 schools, 12 worksites **Suitability of Design:** Greatest **Design:** Group randomized trial **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • Secondary schools • Workplace **Mean Age: nr** **% Female:** nr **Race/Ethnicity:** nr **% White:** nr **SES:** nr	**Intervention Theory:** none stated **Target Group:** Students, Worksite **Intervention Description:** CHIPS Study- Changing Individuals Purchase of Snacks - examined effect of pricing and point-of-purchase promotion effects on sales of low-fat and regular snacks in vending machines: 4 levels of pricing (equal, reduction of 10%, 25%, 50%) and 3 levels of promotion (no signs; low-fat label; label plus sign on machine promoting low-fat choice) in 2 setting types, school and worksite; comparison of adolescent vs. adult responsiveness to pricing and promotion. Machine set-up by study staff including placement of 2 designated rows of low-fat snacks, labels, promotional signs. Sales data recorded each time machine was serviced by trained vending route drivers. Study staff checked. Control condition**:** Prices were equal for low-fat and regular snacks, no promo signage or labeling **Intervention Duration:** 12 months **Intervention treatment intervals 1 month for each combination of 12 treatment conditions**	**Change in % of low-fat food sales**: Price reduction in vending machines: 50% reduction = 93% increase, p<.05 25% reduction = 39% increase, p<.05 10% reduction = 9% increase from baseline of 9.9% of sales. **Labeling and signs indicating low-fat content**. label & sign = 1.1% increase label alone = no difference from baseline (no label) of 14.3% of sales. Data combined school & worksite results. Increase in low-fat snack sales reported as "slightly greater in schools than worksites".

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Friel S **Year:** 1999 **Sample Size:** 821 **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 3 limitations	**Location:** Ireland **Urbanicity:** Urban and rural **Setting:** • School: Grade 3-4 **Mean Age:** 9 years **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** 98.0% **SES:** Mixed	**Intervention Theory:** Social learning theory **Target Group:** Students, Teachers **Intervention Description:** The Nutrition Education at Primary School (NEAPS) program aimed to build awareness of the benefits of healthy eating, induce positive behavior change and increase children's knowledge. It took place in 8 Irish primary schools. 20 x 30 minute sessions over 10 weeks using a cross-curriculum approach. Cartoon characters were part of lessons, resources included lesson plans, activity worksheets, assigned homework, aerobic exercise regime, and inservice training for teachers. Comparison Group Intervention: Usual care **Intervention Duration:** 2.5 months **Follow-up Interval:** 0.5 month	**% change I - % change C** Knowledge -2% ≥ 2 serving fruit & veg per day 4% ≥ 2 salty snacks per day -1% ≥ 3 high sugar snacks per day -21% > 2 high sugar drinks per day -3%
Author: Fries E **Year:** 2001 **Sample Size:** 129 **Suitability of Design:** Least **Design:** Before/after design **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Rural **Setting:** • School: Grade 6 **Mean Age: nr** **% Female:** 45.7% **Race/Ethnicity:** 70% African American **% White:** 17.2% **SES:** Low	**Intervention Theory:** Theory-based program, but theory not named **Target Group:** Students **Intervention Description:** The Goals for Health project targets change in cancer-related behaviors of tobacco use and dietary fat and fiber intake. High-school peer educators were trained to provide 12 50-minute skill-based workshops (1/week for 12 weeks) that emphasized health-related goal setting and nutrition knowledge. **Intervention Duration:** 3.25 months **Post measurement:** 1 week	**% change (pre – post)** Self-reported frequency of intake: high fat desserts -6% high fat snacks -11% p<.01 vegetables -5% fruits 1% total fat score -12% p<.05 total fiber score -15% p<.05 **Nutrition knowledge questionnaire:** knowledge score. 11% self-efficacy f/v intake 8%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Gans KM **Year:** 1990 **Sample Size:** 105 **Suitability of Design:** Moderate **Design:** Time series **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:**Urban **Setting:** • School: Junior high **Mean Age:** 13.3 years **% Female:** 60.0% **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Middle	**Intervention Theory:** none stated **Target Group:** Students **Intervention Description:** Pawtucket Heart Health Program uses cooking contests in home economics classes, coupled with blood cholesterol screening, counseling and referrals to teach students about the relationship between diet and cholesterol. In cook-offs, students selected recipes and modified them to meet AHA prudent diet guidelines; recipes (in several categories) were judged in class for nutrition and taste. Comparison Group Intervention: No comparison group **Intervention Duration:** 3 months **Post intervention measurement:** immediate	Among students with ≥170mg/dl plasma cholesterol there was a 10.7% reduction from baseline
Author: Getlinger MJ **Year:** 1996 **Sample Size:** 67 **Suitability of Design:** Least **Design:** Before/after design **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 1-3 **Mean Age: nr** **% Female:** 50% **Race/Ethnicity:** Mixed ethnic groups **% White: nr** **SES: nr**	**Intervention Theory:** none reported **Target Group:** Students **Intervention Description:** Food consumption and waste by elementary school students at lunch was evaluated for differences associated with 15 minute recess scheduled immediately before or immediately after 15 minute lunch. During week 2 of a 5-week study conducted April-May, the usual after-lunch recess schedule was changed to before-lunch. Children were offered 5 food items and allowed to decline up to two (National School Lunch program 'offer vs. serve' option and portion -size guidelines) The same menu of foods was offered on the same days during the two data collection weeks. **Comparison Group Intervention:** Before after design **Intervention Duration:** 1 month	**% change I – % change C** **Food consumption & waste during lunch:** % increase in food consumption for students with recess before lunch: milk 11.3% p<.05 meat/meat alternative 14.4% p<.05 bread/ alternative 5.3% vegetables 28.4% p<.05 fruit 3.6%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Goldberg SJ **Year:** 1980 **Sample Size:** 276 **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** nr (Phoenix,AZ) **Setting:** • School: Grade K, 2-4 • Workplace **Mean Age:** nr **% Female: nr** **Race/Ethnicity:** Mixed ethnic groups **% White:** 94.0% **SES:** Mixed	**Intervention Theory:** none stated **Target Group:** Students, Teachers, Food Service, Family **Intervention Description:** Intervention included: (1) 18 hr. instruction for teachers by nurse regarding risk factors. for atherosclerosis; (2) teachers developed ongoing classroom curriculum and pre/post exams covering risk factors for atherosclerosis, relationship with diet, sources of dietary fat, and AHA recommendations for lowering risk; (3) parents were sent monthly newsletters (English and Spanish) regarding reducing cholesterol, sat'd fat, and sodium in family diet, and maintaining kcal level that will avoid abnormal weight gain; parent conferences were available for answering questions; (4) school menus were altered to provide skim and 2% milk, margarine in addition to butter, increased boiled and uncooked produce, and decreased fried foods and added salt. **Comparison Group Intervention:** usual curriculum **Intervention Duration:** 27 months	**% change I – % change C** Serum cholesterol 2% Systolic blood pressure 2.8% Diastolic blood pressure 8% Height percentile 11.6% Weight percentile 1.5 % Skinfold thickness (mm) -20% **(insufficient data to compute % change)** Health knowledge score: Intervention group gain p<.05

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Gortmaker SL **Year:** 1999 **Sample Size:** 1560 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grade 6-8 **Mean Age:** 11.7 years **% Female:** 48.0% **Race/Ethnicity:** 63-69% white **SES:** Mixed	**Intervention Theory:** Social cognitive and behavioral choice theories **Target Group:** Students, Teachers **Intervention Description:** Planet Health lessons integrated into existing classroom and PE curricula. Intended to increase moderate and vigorous PA and decrease TV/video viewing, increase intake of fruit and veg and decrease intake of high fat foods, as a means to decrease obesity (primary outcome measure). Teachers given training and materials to use in lessons. Monetary incentive for teacher-submitted PE proposals. All 5 intervention schools given same training. **Comparison Group Intervention:** Standard health curriculum & PE **Intervention Duration:** 18 months **Post measurement:** immediate	**% change I - % change C** Prevalence of obesity girls: –5.5% p=0.03 boys: .8% Incidence of obesity: girls: -2.5% boys: -1.9% Remission from obesity girls: -12.4% , p=.04 boys: 2.8% **TV viewing** girls: -20% p=.001 boys: -10% p=.0003 Physical activity (mod to vigorous hours per/day) girls: 2% boys: 2% % total energy from fat girls: -2% boys: -1.5% Servings of fruit and vegetables: girls: 11% p=.003 boys: 7% Total energy intake girls: -2.5% p=.05 boys: -3%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Gortmaker SL **Year:** 1999 **Sample Size:** 479 students; 14 schools **Suitability of Design:** Greatest **Design:** Non-randomized controlled trial **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grade 4-5 **Mean Age:** 9.2 years **% Female:** 56-60% **Race/Ethnicity:** 91% African American **% White:** nr **SES:** Mixed	**Intervention Theory:** Social cognitive theory and behavioral choice theory: school & individual levels of change **Target Group:** Students **Intervention Description:** The Eat Well and Keep Moving Program included 31 50 minute nutrition and/or PE lessons for 4th and 5th graders. Lessons were integrated across the curricula. Focus was 4 behavior changes: decrease high fat food intake, increase F & V intake, reduce TV viewing, increase moderate to vigorous PA. 18 Eat Well cards linked classroom with food service to increase F & V consumption. Intervention also included activities and marketing to increase F & V, limit TV viewing and increase walking, school newspaper sent home and parent coalition developed to promote parent involvement in campaign. **Comparison Group Intervention:** Usual care **Intervention Duration:** 18 months	**Adjusted Difference of I - C** (adjusted for baseline value of independent variable, sex, ethnicity, total energy intake) **Dietary Intake** Total energy from fat -3.2% (P=.02) Total energy from saturated fat -3.5% (P=.08) No. of fruits & vegetables/1000 kcal +7.5% (P=.14) **Physical Activity** Vigorous activity -9% (P=.22) TV viewing -8% (P=.34)

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Hackett AF **Year:** 1990 **Sample Size:** 4 schools, 700 students **Suitability of Design:** Moderate **Design:** Time series **Quality of Execution:** Fair Execution 4 limitations	**Location:** United Kingdom **Urbanicity:** Urban **Setting:** • School: Middle school **Mean Age:** 11.5 years **% Female:** 48.0% **Race/Ethnicity:** nr **% White:** nr **SES:** Mixed	**Intervention Theory:** none stated **Target Group:** Students **Intervention Description:** Northumberland County Council Department of Education devised a Healthy Eating campaign to improve the quality of school meals and students' eating habits in general. It was run by marketing consultants in the 1987-1988 school year. 39 schools featured a recommended 'dish of the day' (modified healthy meals, lower fat, salt) within a free choice cafeteria system. The other 6 schools offered a structured menu within a fixed-price two-course meal. All students received take-home materials including a record card of healthy meals. No control group. **Intervention Duration:** 9 months **Post Measurement:** immediate	**Pre - Post measurements** **Mean change in intake of:** Sugary foods - .014 Fatty foods -.067 Fibrous foods .021 Healthy foods category.047 p<.01 Unhealthy foods -.015 **Boys % change in:** Wholegrain bread 4% Baked potatoes 2% French fries -7% Low-fat milk 7% High fiber cereal -4% Carbonated beverages -2% Baked beans -12% p<.01 Added salt -1% Chips -3% Sweets/chocolate 1% Added sugar 4% **Girls % change in:** Wholegrain bread 4% Baked potatoes 0% French fries -13% p<.01 Low-fat milk 11% p<.01 High fiber cereal -2% Carbonated beverages -6% Baked beans -7% p<.05 Added salt -8% p<.05 Chips -4% Sweets/chocolate 4% Added sugar -7%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Holcomb JD **Year:** 1998 **Sample Size:** 1114 students 14 schools **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grade 5th • Workplace **Mean Age: nr,** 10-12 y **% Female:** 52.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 6.0% **SES:** Mixed	**Intervention Theory:** none stated **Target Group:** Students, Teachers **Intervention Description:** Teachers in selected schools were provided with the Jump Into Action curriculum and either received special training (n=30) or no special training (n=9). The students received a workbook that provides information about diabetes and encourages students to consume low-fat meals and exercise regularly to prevent obesity. The curriculum integrated health education into a variety of subject areas. **Comparison Group Intervention:** Same intervention curriculum without intensive teacher training **Intervention Duration:** 2.5 months **Follow-up Interval:** 1 month	**% change I - % change C** Nutrition knowledge: trained teacher + curr. 15% curr only 14% Dietary self efficacy trained teacher + curr 8% curr only 13% High fat food intake (dairy) trained teacher + curr -1% curr only -4% Exercise behavior trained teacher + curr 7% curr only 12%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Hopper CA **Year:** 1996 **Sample Size:** 229 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Rural **Setting:** • School: Grade 2,4,5, 6 • Home & Family **Mean Age:** 10.5 years **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Middle	**Intervention Theory:** Used previously developed school health curricula **Target Group:** Students**,** Family **Intervention Description:** Two month program (6 wk for grades 5,6 and 12 wk for grades 2,4). Three conditions: usual school curriculum, school-and home, school only. School & home involved parents as "home team" provided with weekly nutrition (low fat recipes, setting nutrition goals, high/low fat food choices) & physical activity information and points & incentives for diet & exercise behavior (awards, stickers). School curriculum consisted of 18 sessions (40 min each) over 6 wks on physical fitness and 12 sessions (30 min each) over 6 wks on healthy dietary choices and understainding food labels. **Comparison Group Intervention:** Usual curriculum **Intervention Duration:** 2 months **Post Measurements:** Immediately following intervention	**(% change I) – (% change C)** % daily calories from fat school + home gp. -3.8% school gp -3.5% p<.05 **Intake saturated fat** no difference Fitness measures: (Standardized mean difference) •timed 1 mile run no difference •sit-ups no difference •sit & reach school + home .47 p<.05 Knowledge tests: (Standardized mean difference) •exercise knowledge school + home .82 school .90 p<.05 •nutrition knowledge school + home .84 school .46 p<.05 Reported no difference between I & C: skinfold thickness, weight

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Killen JK **Year:** 1988 **Sample Size:** 1447 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** nr **Setting:** • School: Grade 10 **Mean Age:** 15 years **% Female:** 45-48% **Race/Ethnicity:** Mixed ethnic groups **% White:** 69.0% **SES:** nr	**Intervention Theory:** Social-cognitive theory **Target Group:** Students **Intervention Description:** 8 special teachers provided 20 classroom sessions covering Physical Activity, Nutrition, Smoking, Stress and Personal Problem Solving modules. Each session provided information, cognitive and behavioral skills for changing personal behavior and resisting negative peer pressure and practice using those skills. 20 special sessions in regular PE classes, 50 minutes each, 3x/week for 7 weeks. **Comparison Group Intervention:** usual curriculum **Intervention Duration:** 2 months **Post Intervention Measurement:** immediately following intervention	**Boys** **% change I - % change C** BMI -5.2%, p=.05 Heart rate -3.6%, p<.01 Systolic BP 1.8% Diastolic BP 1.4% Skinfold Triceps 4.5% Skinfold Subscapular 1.1% CV health knowledge 84% Food preference score 11% **Standardized mean difference:** Physical activity score .90 **Girls** **% change I - % change C** BMI -1% Heart rate -5%, p<.01 Systolic BP -1.8% Diastolic BP 2.6% Skinfold Triceps -9.9%, p<.01 Skinfold Subscapular -11.0%, p<.01 CV health knowledge 95% 1 Food preference score 25% **Standardized mean difference**: Physical activity score 1.26
Author: Liquori T **Year:** 1998 **Sample Size:** 590 children, 39 classes in 2 schools **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** School: Grade K-6 Home, Workplce, Community wide **Mean Age: nr** **% Female: nr** **Race/Ethnicity:** White, Non-hispanic **% White: nr** **SES:** Low	**Intervention Theory:** Social cognitive theory/Piaget's cognitive devlmnt **Target Group:** Students, Food Service, Family **Intervention Description:** Some classrooms participated in "Cookshops," which engaged children in cooking activities. Some engaged in participatory activities involving food (but not directly preparing it). Approximately equal numbers of classrooms partipated in just cookshops, just participatory activities, both sets of lessons, or neither. All parents in the study schools received a a monthly newsletter. Cafeteria staff in both schools prepared specified foods. **Comparison Group Intervention:** Approximately equal numbers of classrooms partipated in just cookshops, just participatory activities, both sets of lessons, or neither. **Intervention Duration:** 9 months	**% change I - % change C** School meal veg & whole grain intake: Cook + curr. K-3 15% p=.01 Cook + curr. 4-6 23% cook only K-3 10% cook only 4-6 19% curr only K-3 4% curr only 4-6 7%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Luepker RV **Year:** 1988 **Sample Size:** 1839 children, 31 schools **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 3 • Home or Family **Mean Age:** 7.8 years **% Female:** 49.0% **Race/Ethnicity:** nr **% White:** nr **SES:** Mixed	**Intervention Theory:** implied; cites to Perry et al. 1985. **Target Group:** Students, Family **Intervention Description:** The study included 31 elmentary schools in 4 urban public school districts in MN and ND from 1985-1986. It used home- and school-based curricula to encourage changes in specific environmental and behavioral factors in order to influence children's health behaviors, food selection and healthful eathing patterns. 3 intervention groups. (1) Hearty Heart (HH) curriculum: 5-wk, 15-sessions, taught by classroom teachers, discussed dietary fats and salts, link salt and BP, and how to lower salt intake (e.g. reading labels). (2) Home Team (HT) curriculum: 5-wk correspondence course for students and parents (mailed); family game with baseball motif covering same material as HH. (3.) Combined HH and HT. **Intervention Duration:** 1.25 months **Follow-up Interval:** 1 month	**% change I - % change C** Health knowledge 12% Salt intake (g kcal) 1%
Author: Lytle LA **Year:** 1996 **Sample Size:** 1874 **Suitability of Design:** Greatest **Design:** Controlled before/after, prospective **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Not reported **Setting:** • School: Grade **Mean Age: nr** **% Female:** 50.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 69.0% **SES:** nr	**Intervention Theory:** Social Cognitive and Organizational Change **Target Group:** Students, Food Service, Family **Intervention Description:** Full study intervention was not described, but rather the data collection of 24 hour recalls at baseline and follow up were reported in this study. CATCH is a school and individual-level intervention with family component to reduce CVD risk; multisite field trial of student cohort moving from 3rd to 5th grade in California, Louisiana, Minnesota, Texas. Twenty-four hour recall interviews administered to randomly selected subsample of the CATCH cohort at baseline and after intervention to assess change in nutrient intake: total energy, dietary cholesterol, dietary fiber, proportion of energy from fat, protein, carbohydrate and fatty acids. Food record-assisted recall was conducted by trained, certified research staff using Nutrition Data System; methodology developed and validated during CATCH pilot phase. **Intervention Duration:** 36 months **Post intervention Measurement:** immediate	**% change I - % change C** **Nutrient intakes** Total energy kcal -5% % energy from fat -6% % energy sat fat -8% Sodium mg 2% Cholesterol mg -6% Fiber g

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Manios Y **Year:** 1999 **Sample Size:** 1046 (602-I, 444-C) **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 4 limitations	**Location:** Crete **Urbanicity:** Urban **Setting:** • School: Grade 1-6 **Mean Age: nr** **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Middle	**Intervention Theory:** Social Learning Theory **Target Group:** Students, Family **Intervention Description:** This 6-year intervention in 24 primary schools in Crete (with 16 control schools) adapted Know Your Body curricula to program in Greek for grades 1-6. The program was conducted by classroom teachers using 13-17 hours annually for health and nutrition components on diet, fitness, oral health, smoking, alcohol use and accident prevention. Each student was given a workbook. PE instructors delivered fitness and physical activity components, 45 min sessions 2 x week. Parent involvement in program development, parent sessions for feedback and test results, and supporting children for program goals. Also provided heart-healthy alternative foods at intervention school "tuck" shops. **Intervention Duration:** 68 months **Post intervention measurement:** End of study	**% change I - % change C** Energy (kcal) -10.7% p<.05 Total fat (g) -14% p<.01 Saturated fat (g) -16% p<.01 Leisure time moderate to vigorous physical activity (minutes) 107% p<.05 Health knowledge 11% p<.001
Author: Morris JL **Year:** 2002 **Sample Size:** 213 **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity: nr** **Setting:** • School: fourth grade **Mean Age:** 9 years **% Female:** nr **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 66.0% **SES:** Mixed	**Intervention Theory:** Social Cogntive Theory **Target Group:** Students, Family **Intervention Description:** Nutrition knowledge questionnaire and a vegetable preference survey were used. For the vegetable preference survey, students were asked to taste and rate their preference for a group of vegetables. 1 school received no formal nutrition or gardening intervention. 1 school received classroom-based nutrition education consisting of nine lessons. 1 school received in class and hands on gardening lessons. **Comparison Group Intervention:** Researchers were present at varous times to equalize potential for subject knowledge of control versus experimental group. **Intervention Duration:** 12 months **Follow-up Interval:** 6 months	**% change I - % change C** **Nutrition knowledge score: 0%** **Vegetable preference score:** **curr group 9%** **curr + gardening 15%** p<.005 6 month follow-up **Vegetable preference score:** **curr group 6%** curr + gardening 15%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Morris JL **Year:** 2001 **Sample Size:** 97 **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** nr **Setting:** • School: 1st Grade **Mean Age:** nr **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Middle	**Intervention Theory:** Social Cognitive Theory **Target Group:** Students,Teachers, Food Service,Family **Intervention Description:** Teachers developed lessons & integrated into curriculum. Researcher encouraged nutrition topics. Classes did fall and spring vegetable gardens. Harvested vegetables were prepared by food-service staff. Parents & community encouraged to get involved. **Comparison Group Intervention:** regular curriculum **Intervention Duration:** 8 months **Post intervention measurement:** Immediate	Standardized mean differences Nutrition knowledge score: 0.0 (no diff) **Willingness to taste vegetables:** 3.5 p<0.005
Author: Nader PR **Year:** 1999 **Sample Size:** 5106 students, 96 schools **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grades 3-5 **Mean Age:** 8.75 years **% Female:** nr **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 69.0% **SES:** nr	**Intervention Theory:** trans theoretical model of change **Target Group:** Students, Food Service **Intervention Description:** CATCH was a multi component intervention, including classroom curricula, food service modifications, physical education changes and family reinforcement. The aim was to increase PA and consumption of foods low in fat/sat fat/Na, and decrease smoking initiation. This paper only gives an overview of the intervention and refers the reader to previous articles. Comparison Group Intervention: usual care **Intervention Duration:** 26 months	**(change I - change C)** 5th grade 3yr f/u Energy intake kcals -5.6% -2.9% Energy from fat -5.5% -2.8%, p=.01 Energy from sat fat -4.7% -2.4%, p=.02 Cholesterol mg -13.2% -7.6% Sodium mg 0% -3.7%, p=.04 Minutes vigorous PA -2.9% 2.4%, p=.001 Total PA minutes 2.4% 2.8% BMI 0% -1% Triceps Skinfold mm 02% -1% Heat rate (per min) 0.1% 1%, p=.03 Systolic BP 0.1% -0.2% Diastolic BP 1% 0% Cholesterol mg/dl -0.2% 0.7% **Mean difference in:** Knowledge score .03, p=.001 Intention score .04, p=.001

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Nicklas TA **Year:** 1998 **Sample Size:** 2213 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grade 9-12 • Workplace **Mean Age: nr** **% Female:** 56.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 84.0% **SES:** Mixed	**Intervention Theory:** PRECEDE model **Target Group:** Students, Teachers, Food Service, Family **Intervention Description:** "Gimme 5" included: (1) school-wide media marketing campaign (themes changed monthly): colorful stations in cafeterias providing info re 5-A-Day activities, and topics consistent with 5-A-Day message; taste tests and produce giveaways. (2) Five 55-minute workshops for students to develop additional knowledge, positive attitude, and skills to increase F/V consumption. (3) During year 1, at least 1 lesson/semester in required academic courses that encorporated a theme pertaining to F/V. (4) School meals modified to increase variety, portion size, and visual appeal of F/V. Menus emphasize F/V in monthly media promos. (5) Parent component: taste-testing, media displays, and activities at PTA mtgs and family-related functions; brochures, newsletters and coupons mailed at least once per semester. **Comparison Group Intervention:** control students completed baseline and f/u questionnaires Intervention Duration: 27 months	**(% change I - % change C)** Nutritional health knowledge 10% p< .05 **Attitudes toward f & v intake** 0% no difference **Fruit & vegetable intake** 14% at end of study 0% at 1 yr follow up
Author: Perry CL **Year:** 1998 **Sample Size:** 1750 20 schools **Suitability of Design:** Greatest **Design:** RCT, nested cohort **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 4-5 • Home & Family **Mean Age: nr** **% Female: nr** **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 48.0% **SES:** Mixed	**Intervention Theory:** social learning theory **Target Group:** Students, Food Service, Family **Intervention Description:** 5-a-Day Power Plus intervention program consists of behavioral curricula in 4th and 5th grade (16 40-45 minute classroom sessions 2x/week for 8 weeks), parental involvement/education, school food service changes, industry involvement and support. Teams competed to eat more fruit and vegetables at school lunch. **Intervention Duration:** 6 months **Post intervention measurement:** immediate post intervention	**School lunch observation** F & V servings 44% , p<.00 (increase in girls only) Total fat % of kcal 1% Sat. fat % of kcal -3% Fiber g. 15% Total kcal 4% 24 hour recall F & V servings 12% Total fat % of kcal -6%, p=.02 (decrease among Asian & African Am only, no change in white & increase in Hispanics) Sat. fat % of kcal -5% Fiber g. 0%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Petchers MK **Year:** 1988 **Sample Size:** 452 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:**Mixed **Setting:** • School: Grade 6th **Mean Age:**11.1 years **% Female:** 52.6% **Race/Ethnicity:** Mixed ethnic groups **% White:** 97.2% **SES:** nr	**Intervention Theory:** Psychosocial model of health behavior **Target Group:** Students, Teachers **Intervention Description:** Used the Chicago Heart Health Curriculum (Body Power!) which focused on the cardiovascular system, smoking, nutrition, exercise and risk factor review. Curriculum was implemented by regular classroom teachers in the intervention group following a training session. Control group teachers received dilute training session. Each module was taught for 3 - 45 minute sessions per week for four to six weeks. **Comparison Group Intervention:** Usual classroom teaching **Intervention Duration:** 21 months **Follow-up Interval:** 10.5 months	**Knowledge score:** **Small but significant difference favored intervention group (insufficient data to compute effect size)** Non-significant treatment effects reported for following measures: -current behavior -future behavior -attitude toward exercise -attitude toward nutrition -self-esteem
Author: Piper DL **Year:** 2000 **Sample Size:** 2483 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grade 6-10 **Mean Age:** nr **% Female:** 52.0% **Race/Ethnicity:** White, Non-hispanic **% White:** 96.0% **SES:** nr	**Intervention Theory:** Social influences model **Target Group:** Students, Family, Community **Intervention Description:** Healthy for Life (HFL) included 54 lessons delivered sequentially over 12 weeks (intensive version) or in 3 4-week segments (age appropriate version). 4 components: school classroom, peer, family and community. Targeted behaviors: healthy food choices, substance abuse avoidance, sexual behavior abstinance. Used 8 teaching strategies: social inoculation, peer leaders, parent-adult interviews, health advocacy, short-term effects, adnvertising and media, public commitments, peer norms. Peer component - three peer leaders per classroom assisted in 1/3 of curriculum. Family component - included parent orientation, 3 home mailings and parent/adult interview components. Community Component - targeted community messages and positive environment of change. Two treatment conditions existed, either intenvisve or age appropriate. **Intervention Duration**: 3 months **Follow-up Interval:** 48 months	Nonsignificant increase in number of meals/week in less intensive intervention group (no data to compute effect) Significant increase in number of meals/week in intensive intervention group (no data to compute effect)

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Ransome K **Year:** 1998 **Sample Size:** 1350 (803) **Suitability of Design:** Moderate **Design:** Retrospective Cohort Study **Quality of Execution:** Fair Execution 3 limitations	**Location:** Canada **Urbanicity:** Urban, rural and inner city schools represented **Setting:** • School: Grade K-6 **Mean Age:** nr **% Female:** 53.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** nr **SES:** Mixed	**Intervention Theory:** none stated **Target Group:** Students **Intervention Description:** The Alberta School Milk Program (ASMP) provides 2% white and chocolate milk at lunch time at a "reasonable cost". Students are given incentive to buy milk (they receive a reward with every 10 servings of milk consumed). These include cow jokes, school supplies with cow-spots, inflatable cows. The program operates in 555 schools in Alberta; started in 1984 (although start-date for participation in program by individual schools varies). **Comparison Group Intervention:** nr **Intervention Duration:** 12-36 months **Follow-up Interval:** nr	Students in supplemental milk program consumed .5 more serving milk/day

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Harrell JS **Year:** 1999 **Sample Size:** 2109 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grades 3 & 4 **Mean Age:** 8.9 years **% Female:** 50.5% **Race/Ethnicity:** White, Non-hispanic **% White:** 76.0% **SES:** nr	**Intervention Theory:** none stated **Target Group:** Students**,** Teachers **Intervention Description:** Pubic health approach: 2 intervention groups (regualr class and high risk group) • 2x week for 8 weeks regular teachers taught program kits about nutrition, smoking and physical activity behaviors plus physcial activity sessions 3x week. • risk-based approach used separate small classes for kids based on 1 or more CVD risk factors: nutrition classes (cholesterol, obesity), PE (aerobic power), smoking prevention (future smoking). Taught by nurses during regular school hours. **Comparison Group Intervention:** Control group received results of baseline measures. Required both parental and child consent **Intervention Duration:** 2 months **Follow-up Interval:** 0.5 month	**% change I - % change C** Total serum cholesterol regular class -2.6 %, p<.05 high risk class -0.4% Systolic BP regular class -0.5% high risk class -0.3% Diastolic BP regular class -1.4%, p<.05 high risk class -1.7%**,** p<.05 **Skinfold thickness mm (sum of triceps and subscapular)** regular class -3.2%, p<.05 high risk class -4.3%**,** p<.05 BMI regular class 0.5% high risk class 0.8%, p<.05 Predicted aerobic power regular class 4.9%. p<.05 high risk class 3.3% Self-reported physical activity regular class 10% high risk class 13.4% Health knowledge test (**standardized mean difference**) regular class 1.7, p<.05 high risk class .32

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Resnicow K **Year:** 1992 **Sample Size:** 3423 (longitudinal cohort) **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 1-6 • Workplace **Mean Age:**10y post test **% Female:** 57% **Race/Ethnicity:** Mixed ethnic groups **% White:** 11% **SES:** Low	**Intervention Theory:** Social Learning **Target Group:** Students, Teachers, Food Service **Intervention Description:** "Know Your Body" involved: (1) Classroom curriculum (teacher manual + student activity book); teachers given 1-2 d training, and met w/ project coordinator in small groups at least 2x/y; to use curriculum 1x/wk or more for 30-40 min during school year. (2) School-wide: modified foodservice (> fiber and < fat by adding salad bar, increasing visibility/availability of lowfat milk, heart-healthy entrees), peer leader training, student health committees, food tasting parties, poster and essay contest, student aerobics, and special health lectures. **Comparison Group Intervention:** pre/post health and diet questionnaires and biomed exams **Intervention Duration:** 28 months (24 months from second baseline)	**% change I - % change C** **Longitudinal cohort only (high exposure)** Plasma Cholesterol -6.3% Systolic BP -5% BMI 3.6% Fruit intake 4% Vegetable intake 2.4% High fat snacks 1.2% Health knowledge 10%
Author: Reynolds KD **Year:** 2000 **Sample Size:** 1698 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Good Execution 2 limitation	**Location:** United States **Urbanicity:** nr **Setting:** • School: Grade 4 • Home or workplace **Mean Age:** 8.7years **% Female:** 0.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 83.0% **SES:** Mixed	**Intervention Theory:** Social cognitive theory **Target Group:** Students, Food Service, Family **Intervention Description:** High 5 included 3 components. (1) Classroom: 14 lessons (biwkly x7wk) on f/v consump; incl modeling, self-monit, problem-solv, taste-testing, reinforc, other methods. Students given Freggie Book with homewk assignments. Lessons taught by H5 employee, assisted by classrm teacher. High 5 Day occurred in between the 2 curric days: students challenged to eat 5 f/v, recorded intake, parents alerted to help students eat 5 f/v on that day. (2) Parents: invited to Kick-Off Night events; asked to participate in child's wkly homewk activity; given brochures, recipes, refrig magnets, etc as reenforcements. (3) Food Service: received half-day training; had list of intervention activites, including offering at least 10 f/v servings/wk. Intervention Duration: 1.75 months **Post intervention measurement:** 12 months	**% change I - % change C** immediate 1 year 24 hr recall f/v intake 61% 35% school meal f/v intake -2.2% -24% kcals -5% -1% % kcal from fat -7.5% -5.2% % kcal sat fat -7.3% -5.9% fiber g 14.6% -1.6%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Sallis JF **Year:** 2003 **Sample Size:** 24 schools; mean enrollemnt 1109 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 6 to 8 **Mean Age: nr** **% Female:** 49.0% **Race/Ethnicity:** Mixed ethnic groups represented: **% White:** 56% **SES:** Mixed	**Intervention Theory:** Cohen-structural, ecological model of health behav **Target Group:** Students, Teachers, Other Staff, Administration, Food Service, Family **Intervention Description:** Interventions included increasing physical activity and strengthening PE curriculum. Decreasing fat content of foods provided at school and encouragement of lower fat alternative in lunches brought from home. Changes in health policy supporting low fat and increasing activity levels. Convening of a student health committee for peer support and development of school activities. Education of parents regarding diet and physical activities. **Intervention Duration:** 24 months **Follow-up Interval:** 12 months	**% change I - % change C** BMI Boys −3% (p<.05 Girls -0.5% Observed moderate-vigorous physical activity (kcal/day/child) Boys 3.2% Girls 8.5% Sedentary hours/day/student Boys 12.4% Girls 2.8% Total fat and saturated fat (grams) Boys -1% Girls 0%
Author: Sahota P **Year:** 2001 **Sample Size:** 636 students **Suitability of Design:** Greatest **Design:** Randomized Controlled Crossover **Quality of Execution:** Fair Execution 4 limitations	**Location:** United Kingdom **Urbanicity:** Urban **Setting:** • School: Grade 4 and 5 **Mean Age:** 8.4 years **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Middle	**Intervention Theory:** Health Promoting Schools philosophy **Target Group:** Students, Teachers, Administration, Food Service, Family, Community **Intervention Description:** The active programme promoting lifestyle education in school (APPLES) designed with a population approach using a multidisciplinary and multiagency program targeting entire school community: parents, teachers, staff and school environment. Program included teacher training, modified school meals, develop and implement school action plans to promote healthy eating and physical activity over 1 school year. **Comparison Group Intervention:** control schools continued with usual health curriculum, without intervention Intervention Duration: 10 months	**Weighted mean difference I – C** BMI 0 (-0.1 to 0.1) Veg intake 0.3 (0.2 to 0.4) High fat intake 0.1 (-0.2 to 0.4) High sugar intake −0.5 (-1.1to0.1) Fruit intake 0 (-0.5 to 0.5) Physical activity -0.2 (-0.4 to 0.1) Sedentary activity 0 (-0.1 to 0.1)

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Simons-Morton BG **Year:** 1991 **Sample Size:** 4 schools **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States (Texas) **Urbanicity:**Urban **Setting:** • School: Grade 3-4 **Mean Age:** nr **% Female:** nr **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 62.3% **SES:** Middle	**Intervention Theory:** Social cognitive theory **Target Group:** Students, Food Service **Intervention Description:** Go For Health program included classroom health ed: 6 behavior based modules to teach knowledge and skills for diet and physical activity behaviors; New School Lunch (NSL) to provide lower-fat and lower-sodium meals within existing lunch programs via training, menus, purchasing and prep; and Children's Active Physical Education (CAPE) which included 5 6-8 week units to encourage moderate-vigorous PA during PE classes. **Intervention Duration:** 18 months **Post intervention measurement:** immediate	**% change I - % change C** Dietary intake of total fat School 1 -13% School 2 -37% Intake saturated fat -28% Dietary intake of sodium School 1 2% School 2 -27% Physical Activity School 1 25% School 2 15.3%
Author: Stewart KJ **Year:** 1997 **Sample Size:** 742 **Suitability of Design:** Least **Design:** Before-after **Quality of Execution:** Limited Execution 4 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 3, 4, 5 **Mean Age:** 9.4 years **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** 94% **SES:** Middle	**Intervention Theory:** Social learning theory **Target Group:** Students **Intervention Description:** Traditional cardiovascular health curriculum (control) and social learning approach including use of role models (peers, parents, teachers, athletes), skills building, goal setting, environmental component. Four 1 hour classrooom lessons were taught every 6 to 8 weeks after baseline testing. The social learning approach focused on behavioral, individual and environmental factors related to food behavior. Role models were used to reinforce lectures and family reinforcement was encouraged. In the traditional teaching method, information about heart disease and heart healthy eating was provided without social reinforcement **Comparison Group Intervention:** received traditional CV health classroom lessons only. **Intervention Duration:**7 months Follow-up Interval: immediate	**Pre – post % change** <u>Social learning curriculum</u> knowledge 29% p<.01 high fat food intake -22% p<.05 high sodium intake -17% p<.01 high sugar intake 11% p<.01 CV healthy food intake 1% BMI 3% p<.01 total chol (mg.dl) -1% p<.05 systolic BP -0.1% diastolic BP -3% p<.01 <u>5 A Day curriculum</u> knowledge 29% p<.01 high fat food intake -19% p<.01 high sodium intake -13% p<.01 high sugar intake -11% p<.01 CV healthy food intake 1% BMI 3% p<.01 total chol (mg.dl) -4% p<.01 systolic BP -0.3% diastolic BP -0.2%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Tell GS **Year:** 1987 **Sample Size:** 828 3 schools **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 4 limitations	**Location:** Norway **Urbanicity:** Urban **Setting:** • School: Grade 5-7 **Mean Age: nr** **% Female: nr** **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Middle	**Intervention Theory:** none stated **Target Group:** Students **Intervention Description:** Oslo Youth Study was part of the WHO Collaborative Study on Health Promotion in Youth aimed to develop a comprehensive health education program and evaluate its feasability and effect on prevention and reduction of CVD and cancer risk factors. The intervention took place between 9/79 and 1/81 in 3 Oslo schools and focused on nutrition, cigarette smoking and alcohol, and physical activity via nutrition and smoking curriculum and PE. Students with the highest cholesterol at baseline received home visits from a nutritionist. **Comparison Group Intervention:** Control students took baseline surveys **Intervention Duration:** 16 months **Follow-up Interval:** 2 months	**% change I - % change C** BMI Boys 0.3% Girls -2.3% Triceps Skinfold Boys 4.3% Girls 1.2% Pulse rate Boys -7.5% p<0.001 Girls 1.4% Systolic BP Boys 0.5% Girls 3.2% Diastolic BP Boys 2.7% Girls 6.9% Total cholesterol (mmol/l) Boys -4.2% p<0.05 Girls -3.4% p<0.05 HDL cholesterol Boys -6.7% Girls 14%
Author: Thackeray R **Year:** 2000 **Sample Size:** 448 **Suitability of Design:** Greatest **Design:** Non-randomized trial **Quality of Execution:** Fair Execution 3 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: Grade 7-8 **Mean Age:** nr **% Female:** nr **Race/Ethnicity:** Mixed ethnic groups represented **% White:** nr **SES:** Mixed	**Intervention Theory:** research related to social marketing **Target Group:** Students, Teachers, Other Staff, Food Service, Family **Intervention Description:** The study involved 7th and 8th graders, parents and faculty associated with three middle schools in the Salt Lake City School District. I1 received social marketing intervention, including school-wide events, communications, food service modifications and parental communication. I2 received 5-a-Day curriculum only intervention. A series of focus groups with students, parents, teachers and staff was held prior to the intervention. **Comparison Group Intervention:** All of sample, including controls, may have been exposed to local or national 5 a day messages or health class **Intervention Duration:** 3 months **Follow-up Interval:**1 month	Data not available to compute effect sizes. Favorable changes reported for: • fruit servings daily • vegetable servings daily • knowledge of 5 a Day requirements No change reported for: • choosing veg for lunch Negative change reported for: • self efficacy for f/v intake • choosing fruit at lunch

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Turnin MC **Year:** 2001 **Sample Size:** 1876 16 schools in 1 district **Suitability of Design:** Moderate **Design:** Retrospective **Quality of Execution:** Fair Execution 4 limitations	**Location:** France **Urbanicity:** Suburban **Setting:** • School: Grade 3-5 **Mean Age:** 9 years **% Female:** 52.5% **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Middle	**Intervention Theory:** none stated **Target Group:** Students **Intervention Description:** In 1996-1997, 16 schools in Southwestern France in which intervention schools implemented computerized nutritional learning games during the health education class for 5 weeks. **Comparison Group Intervention:** Usual nutritional teaching provided by teachers in both I & C groups **Intervention Duration:** 1.25 months **Post Measurement Interval:** end of study	**% Difference I - C** Calories 0% Fat (g) -1% p<.05 Fiber (g) 4% p<.05 Nutrition knowledge 6% p<.001
Author: Vandongen R **Year:** 1995 **Sample Size:** 1147 30 schools **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Limited Execution 4 limitations	**Location:** West Australia **Urbanicity: nr** **Setting:** • School: Grade 6 • Home or Family **Mean Age: nr** **% Female:** nr **Race/Ethnicity:** nr **% White:** nr **SES: nr**	**Intervention Theory:** no theory identified **Target Group:** Students, Teachers, Family **Intervention Description:** Nutrition and/or fitness programs aimed to improve CV health in school children. 5 health programs: fitness, fitness + school nutrition, school-based nutrition, school + home-based nutrition, home-based nutrition, and control. Targets were to increase consumption of fruit, vegetables, whole-grain bread, cereals relative to other foods, and decrease proportion of intake of fatty, sugary & salty foods. School nutrition: 10 1 hour lessons aimed at knowledge, attitudes and eating habits, included program guide, videos, half day training for teachers. Home nutrition: 5 nutrition messages in comics, homework exercises, food prep and parental help. Fitness ed: 6 30 min classroom sessions replaced usual weekly health ed lessons, plus 15 min/day fitness activity sessions. **Comparison Group Intervention:** Control schools were visited by the research team, same testing **Intervention Duration:** 9 months **Post Intervention measurement:** immediate	See table below

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Walter HJ **Year:** 1988 **Sample Size:** 3388 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grade 4-8 **Mean Age:** 9 years **% Female:** 49.0% **Race/Ethnicity:** Mixed ethnic groups represented **% White:** 48.0% **SES:** Mixed	**Intervention Theory:** Health belief model, social learning theory **Target Group:** Students, Teachers **Intervention Description:** Know Your Body curriculum. Educational intervention designed to modify risk factors associated with coronary heart disease in two demographically different school age populations: higher SES white Westchester Co schools and lower SES black Bronx schools. Teacher-delivered curriculum (informaiton & behavioal skills) focused on diet (lower fat, cholesterol, sodium; increase complex carbs & fiber, and maintain ideal body weight), physical activity (adopt regular endurance exercise) and cigarettte smoking for 2 hours a week during 4th through 8th grades. Baseline risk factors measured in 4th grade (again in 5th, 6th, 7th, 8th) and intervention students discussed individual risk status and behavioral strategies for needed changes. Control students received risk status results by mail with recommendaitons. All parents received health risk status report and those students exceeding recommended cut points were referred to usual source of medical care. **Comparison Group Intervention:** Standard school health curriculum, but did have risk status report sent home with recommendations **Intervention Duration:** 60 months **Follow-up Interval:** At end of 5 year intervention	**Five year % change difference** **Systolic blood pressure (mmHg)** Westchester: 0.57% Bronx: -0.53% **Diastolic blood pressure(mmHg)** Westchester: -0.06% Bronx: 1.37% **Plasma total cholesterol (mg/dl)** Westchester: -5.00% Bronx: -2.77% Plasma HDL cholesterol (mg/dl) Westchester: 0.94% Bronx: 3.29% Ratio plasma total chol. : HDL Westchester: -4.53% Bronx: -4.89% Ponderosity index (kg/m^2) Westchester: -4.2% Bronx: -4.24% Recovery index (fitness) Westchester: 4.59% Bronx: -0.13% Health knowledge score Westchester: 20.53% Bronx: 18.53% % Change diff in 24 hour intake Total fat (%kcal) Westchester: -11.0% Bronx -5.5% Saturated fat (%kcal) Westchester -15.4% Bronx -15.5% Total protein (%kcal) Westchester -4.4% Bronx -3.8% Total carbohydrates (%kcal) Westchester 8.6% Bronx 5.6% Cholesterol/1000 kcal (mg) Westchester -16.2% Bronx 7.8% Sodium/1000 kcal (mg) Westchester -5.1% Bronx 4.4% **Total kilocalories** Westchester 33.4% Bronx -23.4%

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Webber LS **Year:** 1996 **Sample Size:** 5106 **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Good Execution 1 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: grade 3 **Mean Age:** 8.8 years at follow up **% Female:** nr **Race/Ethnicity:** Mixed ethnic groups **% White:** 69.9% **SES:** nr	**Intervention Theory:** Social Cognitive Theory **Target Group:** Students, Teachers, Food Service, Family **Intervention Description:** Child and Adolescent Trial for Cardiovascular Health (CATCH) implemented 1991-1994 at 4 study centers in San Diego, New Orleans, Minneapolis, and Houston. School-based: increased physical acitivity, lower fat meal choices, curriculum. Goals were to reduce individual serum total cholesterol levels, to reduce individual dietery fat and sodium and in school food service, to increase moderate-to-vigorous physicial activity in PE class, to prevent onset of smoking. School +/- family intervention component. **Comparison Group Intervention:** Control group - usual education/food service/activity **Intervention Duration:** 30 months **Post-intervention measurement:** immediate	**(change I - change C)** BMI Caucisian: report no difference (no data to compute effect size) Hispanic: report no difference* African American 0.47 kg/m^2 Triceps skinfold Report no difference* Systolic Blood Pressure MN site 1.5 mm Hg LA site -1.1 mm Hg TX site -0.59 mm Hg CA site report no difference* **Heart rate**: report no difference* **Serum total cholesterol**: 0.4 mg/dl not significant difference **HDL-C**: -0.3 mg/dl **apoB**: report no difference* (*no data to compute effect size)
Author: Wechsler H **Year:** 1998 **Sample Size:** 6902 students, 6 schools **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Good Execution 1 limitations	**Location:** United States **Urbanicity:** Urban **Setting:** • School: grades 1-4 **Mean Age: nr** **% Female:** nr **Race/Ethnicity:** Largely Latino **% White:** nr **SES: Middle**	**Intervention Theory:** Social Marketing Theory **Target Group:** Students **Intervention Description:** Social marketing techniques to encourage behavior change were presented to students to encourage selection of low-fat milk. This included an auditorium presentation about heart health. Students were provided with opportunities to try low fat white milk at two different occasions. The three intervention schools participated in contests and received family information. Milk selection and consumption were measured at baseline and post intervention (5 days each) **Comparison Group Intervention:** Usual curriculum **Intervention Duration:** 2 weeks **Follow-up Interval:** 3-4 months	**Proportion of disappeared milk that was low-fat** immediately post intervention 32% 3-4 months post intervention 34% Note: 1/3 of sample choose no milk and 1/5 of children who choose milk did not open carton

Study	Population and Setting	Intervention and Comparison	Summary Effect Measures
Author: Whitaker RC **Year:** 1993 **Sample Size:** 696 **Suitability of Design:** Least **Design:** Before/after design **Quality of Execution:** Fair Execution 4 limitations	**Location:** United States **Urbanicity:**Urban **Setting:** • School: Grade 1-5 **Mean Age:** nr **% Female:** nr **Race/Ethnicity:** White, Non-hispanic **% White:** nr **SES:** Mixed	**Intervention Theory:** None stated **Target Group:** Students**,** Food Service **Intervention Description:** Passive environmental intervention where an increased number of low fat food items were made available in schools and menu selection was tracked and analyzed for nutrient content and plate waste. School food service increased the # of days per month that a low-fat lunch entrée (<= 30% of kcal from fat) was available as one of the 2 options (increased from 23% of days to 71% of days). Regular menu for 6 months (before), 2 months transition then continued and collected data for 6 months (after). **Intervention Duration:** 6 months baseline, 8 months intervention **Follow-up Interval:** collect data for 6 months after first 2 months of intervention	**% (post) - % (pre)** % total kcal from fat of average meal purchased -6% p=.02
Author: Whitaker RC **Year:** 1994 **Sample Size:** 2445 children, 16 schools **Suitability of Design:** Greatest **Design:** RCT **Quality of Execution:** Fair Execution 2 limitations	**Location:** United States **Urbanicity:** Mixed **Setting:** • School: Grade K-5 **Mean Age:** nr **% Female:** nr **Race/Ethnicity:** Mixed ethnic groups **% White:** nr **SES:** nr	**Intervention Theory:** implied: social learning theory **Target Group:** Students, Food Service, Family **Intervention Description:** Both C and I schools were provided a low-fat lunch entrée as 1 of 2 daily choices. Students customarily given monthly lunch menus to bring home. For I-students only, menus were modified to highlight low-fat option and give fat content of both daily entrees. Prior to onset, parents at I-schools only were sent: (1) modified menu for upcoming month; (2) pamphlet describing healthy diets for children, fat and cholesterol consumption, parent's role in modeling healthy dietary habits, tips for low-fat eating at home; (3) 1-page letter describing availability of daily low-fat entrée and encouraging parents to promote them. **Intervention Duration:** 4 months **Post intervention measurement: i**mmediate	**% change I - % change C** Low fat (>30kcal fat) lunch choice 2.6% p=0.03

Summary Effect Measures from Vandongen R, et al. (1995)

Outcomes	Boys Fitness only (n=75)	Boys Fitness & School Nutrition (n=72)	Boys School Nutrition Only (n=73)	Boys School & Home Nutrition (n=54)	Boys Home Nutrition Only (n=86)	Girls Fitness only (n=75)	Girls Fitness & School Nutrition (n=77)	Girls School Nutrition Only (n=91)	Girls School & Home Nutrition (n=65)	Girls Home Nutrition Only (n=75)
Sugar % energy	-18.0%	-17.7%	-3.7%	-18.9%	-8.3%	-5.1%	-7.4%	-2.6%	-1.3%	6.6%
Total fat % energy	3.4%	1.5%	-3.4%	7.9%	0.0%	-0.3%	-0.5%	0.0%	3.8%	-7.2%
Sat. fat % energy	-0.8%	-0.1%	-5.1%	5.7%	-0.7%	-1.4%	-4.9%	0.1%	-0.3%	-7.8%
poly/sat fat ratio	10.5%	0.2%	0.4%	-6.6%	-6.6%	13.7%	19.1%	13.4%	21.1%	5.8%
Fiber g/day	-8.9%	9.2%	13.7%	15.1%	1.3%	9.2%	-6.8%	-1.7%	10.0%	-6.5%
Sodium g/day	-16.5%	-4.7%	-13.4%	-4.5%	4.5%	13.6%	28.6%	29.4%	4.1%	8.9%
Energy MJ/day	-13.7%	-5.5%	-9.8%	-4.4%	-5.8%	5.9%	7.4%	12.2%	7.5%	3.0%
Systolic B/P	0.9%	0.9%	0.6%	-0.2%	1.1%	-0.4%	-1.2%	0.0%	1.2%	1.9%
Diastolic B/P	0.6%	1.6%	2.3%	0.4%	2.4%	-3.0%	-1.6%	0.3%	2.5%	0.6%
Cholesterol mmol/l	6.4%	3.0%	4.3%	5.0%	4.3%	9.3%	3.0%	4.2%	7.1%	6.7%
Percentage body fat	0.5%	-3.1%	2.5%	2.6%	-3.1%	-2.9%	-1.1%	1.7%	0.0%	-1.1%
Triceps skinfold	1.4%	-7.0%	4.5%	0.7%	-5.4%	-5.4%	-9.9%	-5.7%	-4.3%	-3.8%
Subscap. Skinfold	-4.0%	1.1%	6.1%	11.2%	-7.7%	-6.6%	6.9%	8.9%	7.5%	1.2%
BMI	-0.6%	2.2%	2.2%	0.5%	0.0%	-2.3%	1.1%	-0.6%	-1.7%	-0.7%
Laps	3.5%	8.4%	-2.0%	-1.1%	-4.6%	14.9%	17.3%	-0.4%	6.7%	-2.7%
Run time	-1.3%	-1.4%	6.5%	6.5%	1.1%	-8.2%	-4.3%	5.8%	5.9%	4.8%

Included Studies

The number of studies and publications do not always correspond (e.g., a publication may include several studies or one study may be explained in several publications).

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Search Strategies

Electronic searches of the literature were conducted by a public health librarian in the databases listed below. The team also reviewed the references listed in all retrieved articles, review articles, and systematic reviews, and consulted with experts on the systematic review development team and elsewhere to identify additional articles. Articles were excluded if they were not available in English. The initial literature search on the topic was conducted in 2002.

Total from 4 searches: 326 + 475 + 377 + 724 = 1902 (includes some overlap in results)

Database: MEDLINE, 326 Results

Timeframe: 1966 to October 5, 2002

Search for: 9 or 10 or 11 or 12

1. school based nutrition.tw. (28)
2. (nutrition: or diet or dietary or fruit or vegetable: or food habits or eating).tw,hw. (357251)
3. school:.tw,hw,jw. (112117)
4. 2 and 3 (5894)
5. 1 or 4 (5894)
6. 5 and ((education: or intervention: or program:).tw,hw. or ed.fs.) (2644)
7. limit 6 to english language (2253)
8. limit 7 to yr=1980-2003 (1974)

Database: MEDLINE, 475 Results

Timeframe: 1966 to March 3, 2003

1. schools/ (8051)
2. (nutrition$ or menu$ or meal$ or food$ or vending machine$ or lunch$ or breakfast$ or snack$).mp. (275580)
3. 2 not (foodborne.mp. or food poisoning/) (270459)
4. (physical activit$ or fitness).mp. or exercise/ or physical fitness/(49212)

5. consumer education.mp. or health education/ (34203)
6. media literacy.mp. (11)
7. exp marketing/ (17657)
8. (fund raising$ or fundraising$).mp. (2676)
9. 4 or 5 or 6 or 7 or 8 (102272)
10. 9 and 3 (7827)
11. exp diabetes mellitus/pc or exp obesity/pc or exp cardiovascular diseases/pc (78994)
12. 3 or 10 or 11 (345623)
13. 1 and 12 (738)
14. limit 13 to (human and english language and yr=1980-2003)

Database: Health Promotion and Education Database, 377 Results

Major Descriptor = (nutrition* or diet or food* or eating*) and (school* or high school* or elementary school* or junior high school*) and (intervention strategies or risk factor intervention or program*)

Form = not program

Year = 1980 - 2002

Databases searched: SYSTEM:OS - DIALOG OneSearch (724 Results)

- File 5:Biosis Previews(R) 1969-2003/Feb W4 (c) 2003 BIOSISALERT.
- File 10:AGRICOLA 70-2003/Feb (c) format only 2003 The Dialog Corporation
- 34:SciSearch(R) Cited Ref Sci 1990-2003/Feb W4 (c) 2003 Inst for Sci Info *
- File 35:Dissertation Abs Online 1861-2003/Feb (c) 2003 ProQuest Info7&Learning
- File 48:SPORTDiscus 1962-2003/Feb (c) 2003 Sport Information Resource Centre
- 50:CAB Abstracts 1972-2003/Jan (c) 2003 CAB International *
- File 51:Food Sci.&Tech.Abs 1969-2003/Feb W4 (c) 2003 FSTA IFIS Publishing
- File 53:FOODLINE(R): Food Science & Technology 1972-2003/Mar 03 (c) 2003 LFRA
- File 65:Inside Conferences 1993-2003/Mar W1 (c) 2003 BLDSC all rts. reserv.
- File 68:Env.Bib. 1972-2002/Jun (c) 2002 Internl Academy at Santa Barbara
- File 71:ELSEVIER BIOBASE 1994-2003/Mar W1 (c) 2003 Elsevier Science B.V.
- 73:EMBASE 1974-2003/Feb W4 (c) 2003 Elsevier Science B.V. *
- File 79:Foods Adlibra(TM) 1974-2002/Apr (c) 2002 General Mills *
- 91:MANTIS(TM) 1880-2002/Oct 2002 (c) Action Potential
- 94:JICST-EPlus 1985-2003/Mar W1 (c)2003 Japan Science and Tech Corp(JST) *
- File 98:General Sci Abs/Full-Text 1984-2003/Jan (c) 2003 The HW Wilson Co.
- 135:NewsRx Weekly Reports 1995-2003/Feb W2 (c) 2003 NewsRx *File 135
- 143:Biol. & Agric. Index 1983-2003/Jan (c) 2003 The HW Wilson Co
- 144:Pascal 1973-2003/Feb W4 (c) 2003 INIST/CNRS
- 149:TGG Health&Wellness DB(SM) 1976-2003/Feb W3 (c) 2003 The Gale Group
- 155:MEDLINE(R) 1966-2003/Feb W4 (c) format only 2003 The Dialog Corp.
- 156:ToxFile 1965-2002/Dec W4 (c) format only 2003 The Dialog Corporation *.
- File 162:CAB Health 1983-2003/Jan (c) 2003 CAB International *

- File 164:Allied & Complementary Medicine 1984-2003/Feb (c) 2003 BLHCIS
- File 172:EMBASE Alert 2003/Mar W1 (c) 2003 Elsevier Science B.V.
- File 203:AGRIS 1974-2003/Jan Dist by NAL, Intl Copr. All rights reserved
- File 266:FEDRIP 2003/Jan Comp & dist by NTIS, Intl Copyright All Rights Res
- File357:Derwent Biotech Res. _1982-2003/Mar W2 (c) 2003 Thomson Derwent & ISI *
- File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec (c) 1998 Inst for Sci Info
- File 442:AMA Journals 1982-2003/Jun B1 (c)2003 Amer Med Assn -FARS/DARS apply
- File 444:New England Journal of Med. 1985-2003/Mar W1 (c) 2003 Mass. Med. Soc.
- File 467:ExtraMED(tm) 2000/Dec (c) 2001 Informania Ltd.
- File 482:Newsweek 2000-2003/Feb 28 (c) 2003 Newsweek, Inc.

Set Items Description

S1 921069 SCHOOL OR SCHOOLS OR K12 OR K(1)12 OR KINDERGARTEN OR GRADE()SCHOOL? ?

S2 8375141 OBESITY OR NUTRITION OR EXERCISE OR PHYSICAL()ACTIVITY OR - FOOD? OR BREAKFAST? ? OR LUNCH? OR DINNER? OR SNACK? OR VENDI- NG()MACHINE? ? OR MENU OR MENUS OR DIABETES OR CARDIOVASCULAR OR FITNESS OR MEDIA()LITERACY OR CONSUMER()EDUCATION

S3 519892 MEALS OR ADVERTISING OR MARKETING

S4 146144 S1 AND (S2 OR S3)/1980:2003

S5 42 S/TI AND (S2/TI AND S3/TI) AND S4

S6 29 RD S5 (unique items)

S7 1406 S1/DE AND (S2/DE AND S3/DE) AND S4

S8 1100 RD S7 (unique items)

8/5/1 (Item 1 from file: 5)

DIALOG®File 5:Biosis Previews®

Disclaimer

The findings and conclusions on this page are those of the Community Preventive Services Task Force and do not necessarily represent those of CDC. Task Force evidence-based recommendations are not mandates for compliance or spending. Instead, they provide information and options for decision makers and stakeholders to consider when determining which programs, services, and policies best meet the needs, preferences, available resources, and constraints of their constituents.

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