

Unpublished Dissertations and Theses in Child Nutrition Programs [1999-2001]

Annotated Bibliography

There is a significant amount of research conducted by graduate students as part of requirements for a graduate degree program. This listing of theses and dissertations written after 1999 was compiled based on submissions from college and university faculty and a search in Dissertations Abstracts. These theses and dissertations are grouped into content categories. Within each category, citations are included in chronological order with the most recent year first. Copies of theses and dissertations can be ordered through interlibrary loan at most colleges and universities.

Dietary Guidelines

Burns, M. D. (1999). *Compliance of Illinois school lunch menus with the Dietary Guidelines for Americans: A needs assessment.* Unpublished doctoral dissertation, University of Illinois, Urbana-Champaign.

The two purposes of this study were to determine if the lunches served by schools participating in the National School Lunch Program comply with the Dietary Guidelines for Americans (DGAs) and to compare the actual compliance to the perceived compliance as identified by the school district food service director. Results of this qualitative research indicated that school food directors (n=17) perceived they are complying with the DGAs and are fairly knowledgeable about the guidelines. However, poor student acceptance of and the higher cost of the lower fat and lower sodium, and fresh foods were factors limiting the full compliance with the DGAs. Based on the nutrient analysis of seven districts' lunch menus, directors were not complying as well with the guidelines as they perceived. Areas of greatest discrepancy included the fat, saturated fat, and sodium content of actual lunches served in comparison with the perceived compliance of these nutrients. Directors indicated that nutrition education was needed in the use of computerized dietary analysis programs, the development and use of standardized recipes, the incorporation of commodity foods into the modified menus, and meal preparation techniques to help meet the guidelines. The results of this study indicated that school food service directors were trying to comply with the DGAs and were fairly knowledgeable about the guidelines. However, more personalized nutrition education focused on the specific needs of each director is warranted.

Food Service

Labiner, J.M. (2000). *Increasing the healthfulness of the school nutrition environment (foodservice).* Unpublished doctoral dissertation, The University of North Carolina, Chapel Hill.

This analysis identified the state, district, and school policies and characteristics associated with a healthful school nutrition environment. Using secondary data from the 1994 School Health Policies and Programs Study, scales rating schools based on the healthfulness of foodservice and nutrition instruction practices were developed. Scale scores were used as the dependent variables in a series of regression models. Different categories of variables were found to be associated with more healthful school foodservice practices, including policies and support from higher levels of government and characteristics of school personnel. State and district policies that required incentives to induce the inclusion of nutrition in curricula positively affected school

commitment to nutrition instruction exposure. The results of this analysis were used to recommend state, district, and school policies to improve school nutrition programs. Policies suggested redress the externality and information asymmetry in the market for healthful school nutrition.

LeBlanc, Y. M. L. (2000). *A comparison of foodservice employees' and students' perceptions of satisfaction with school foodservice programs*. Unpublished doctoral dissertation, The University of Southern Mississippi, Hattiesburg.

This study examined relationships between quality of service school foodservice (SFS) employees believe students receive and quality of service as reported by students. This study also determined if this association correlates with rate of participation. Participants were SFS employees solicited from 41-middle/junior high schools contracted with the Foodservice Analysis and Benchmarking Service for the analysis of the National Food Service Management Institute, Applied Research Division's Middle/Junior High School Foodservice Survey during the 1999-2000 school year. Of the 270 SFS employee surveys mailed to 41 schools, 240 surveys were returned from 37 schools, a return rate of 88%. Two hundred nine usable SFS employee surveys and 8,580 student surveys from 34 schools in South Dakota, Texas, California, Louisiana, Georgia, Michigan, and Virginia were used in the data analysis. The researcher performed a comparison of average employees' and students' ratings in a matched design with the unit of analysis being school to school. Across all schools, SFS employees' satisfaction means were significantly higher ($M = 4.61$, $SD = 1.11$, $p < .01$) than students' means ($M = 3.83$, $SD = .62$). The study reported significant correlations for students' perceptions of the service factors to Overall Satisfaction and Ambiance and Staff factors to rate of participation. Employees' responses to how they thought the students would rate Food Quality significantly correlated to how employees thought students rated staff.

Levins, J. B. (2000). *Student satisfaction, participation, and district change management activities associated with the implementation of a new menu system in Mississippi high schools*. Unpublished doctoral dissertation, The University of Southern Mississippi, Hattiesburg.

The School Meals Initiative for Healthy Children regulations were implemented in the National School Lunch Program in July of 1998. These regulations not only required that menus meet the traditional one-third of the RDAs for certain nutrients, but regulations now required that school lunches contain no more than 30% fat, less than 10% saturated fat; were lower in sodium; and higher in fiber. The Office of Child Nutrition of the Mississippi State Department of Education and The University of Southern Mississippi obtained a Team Nutrition grant to implement these regulations with a new menu system consisting of a three-week cycle menu and a customized chart for substitutions. This system was known as *Mississippi Cycles (MsC)*. The grant also included training of the Child Nutrition Program (CNP) directors and suggestions for change management strategies for implementation. The researcher evaluated student satisfaction, student participation, and change management activities associated with the implementation of the *MsC* menu system. The researcher compared results of high school student foodservice satisfaction surveys completed before the implementation, in the Spring of 1998, with those completed after the implementation, in the Spring of 1999. She also compared student participation rates in the school lunch program in the same high schools in 1998 with those in 1999. Change management activities were described and related to student foodservice satisfaction, student participation, opinions of CNP directors and foodservice managers, and with CNP directors' job performance as measured by compliance with the menu system. The researcher found that there were no significant changes in student satisfaction or student participation rates after the introduction of the new menu system. The researcher found a significant relationship between change management activities with overall foodservice satisfaction and satisfaction with the food quality factor. Although the CNP directors and managers had a positive attitude toward the menu system, this was not significantly related to the use of change management activities. Previous research showed that student participation rates were lower with menus low in fat. Because of the lack of a significant decrease in student foodservice satisfaction and student participation rates, this new menu was considered successful in implementing lower fat, saturated fat, and sodium, and higher fiber menus.

Rogers, K. (2000). *The effect offer versus serve has on returned, unopened milk cartons in the National School Breakfast Program at three elementary schools in Indiana.* Unpublished master's thesis, Mississippi State University, Mississippi State.

The purpose of this study was to determine if there was a significant decrease in the number of returned, unopened milk cartons when Offer versus Serve was implemented in the National School Breakfast Program at three elementary schools in Indianapolis. The study attempted to evaluate the effect of grade level, school site, and menu on returned, unopened milk cartons. Data were collected for a total of fifteen days before and after intervention from approximately 700 students. Results indicated that the Offer versus Serve option was effective in reducing waste in Wayne Township Schools, Indiana.

Wie, S. H. (2000). *Cost analysis of alternative disposal methods for wastes generated by foodservice operations.* Unpublished doctoral dissertation, Kansas State University, Manhattan.

The two purposes of this study were to determine costs of alternative disposal methods for wastes generated in foodservice operations and to develop a decision tree to select the most cost-effective disposal alternative for food service operations. Four cases, including a central food processing center in a school district (CFPC), a continuing-care retirement center (CCRC), a university dining center, and a commercial restaurant, were studied. Results of the study indicated that the most effective alternative varies by type of foodservice operation. Off-site composting and food recovery for food wastes and landfill and recycling for packaging wastes were the most cost-effective alternatives for the CFPC. Use of the garbage disposal for food wastes and landfill and recycling for packaging wastes were the least costly alternatives in CCRC. Animal feeding for food wastes and landfill and recycling for packaging wastes were the most cost effective alternatives for the university dining center. The most cost-effective alternative for the commercial chain restaurant was landfill for food and packaging wastes and recycling cardboard boxes. The decision tree presented the decision-making process that occurs when conducting cost analysis and subsequent decision-making. Foodservice directors can use the decision tree to evaluate the results of the cost analysis.

Nutrition

An, M. Y. (2001). *Nutrient consumption of school-aged children participating in the School Breakfast Program in a rural district of Kansas.* Unpublished master's thesis, Kansas State University, Manhattan.

The two purposes of this study were to investigate nutrient consumption of school-aged children participating in a School Breakfast Program and to ascertain nutrient contribution of each breakfast component. The weighed plate waste method was used to determine the nutrient intake of students. The nutrient contents of the school breakfasts as planned, selected, and consumed were analyzed for 12 nutrients. The nutrient contribution and nutrient density per penny were compared for each nutrient in each menu component. In addition, the nutrient intake was evaluated based on the popularity of the menu item, gender, and grades. Students consumed an average 428 calories, with about 15% of energy from protein, 60% from carbohydrate, 26% from total fat, and 8% from saturated fat. The nutrient intakes of students met the US Department of Agriculture (USDA) nutrient goals except for energy, fiber, and sodium. The nutrient content of the meals the students selected was significantly higher than the planned menus for energy, total fat, saturated fat, protein, and vitamin A. The nutrient content of meals as selected was significantly higher than the meals as consumed for all nutrients. There was a statistical interaction between popularity of menu items, grade level, and the nutrient content of the meals as selected for protein and iron. The popularity of menu items was a main effect in nutrient content of meals as selected and consumed. Actual nutrient intake depended on the popularity of menu items offered. Another significant main effect was grade levels for total fat and calcium, which was qualified by the two-way interaction between gender and grade level for saturated fat, protein, iron, vitamin C, and carbohydrate. Gender

itself was not a significant main effect. The entrée contributed significantly more energy, total fat, protein, and sodium than other meal components. Cereal provided significantly more iron and vitamin A and was the most economical source of energy, iron, vitamin A, sodium, and carbohydrate. Milk was the most economical source of calcium and protein. This study supported other research that found school breakfast did not meet three USDA requirements; the energy requirement, the need to increase fiber, and the need to decrease sodium.

Jackson, K.R. (2000). *The impact of eating breakfast on the academic achievement of fourth-grade students*. Unpublished doctoral dissertation, Saint Louis University, St. Louis.

The purpose of this study was to determine the impact of breakfast on the academic achievement of fourth grade students in a southeast Missouri school district. A secondary goal of the study was to discover if the district could expect to see an improvement in student achievement by implementing a school breakfast program. Data for the study was gathered through interviews, student surveys, attendance data, student health data, free and reduced-price lunch data, and Normal Curve Equivalent scores from the TerraNova achievement test. Achievement results were evaluated based on three hypotheses that addressed breakfast participation, gender, and free and reduced-price lunch status. Formal studies conducted by researchers at the University of Minnesota, Harvard, Rutgers, and Tufts document that students who ate breakfast were more alert, had improved concentration skills, were less disruptive, and had higher test scores. Results from this study supported the findings from previous studies. The data from this study suggested that for students who qualify for free and reduced-price lunches, there were factors other than failing to eat breakfast that contributed to lower achievement scores. According to state statistics, 75% of Missouri schools offer a school breakfast program. Yet, only 20% of the students eat a school breakfast, and an estimated additional 20% of the students eat nothing for breakfast. Given the proposed benefits of eating breakfast on students' performance and behavior, Missouri school districts should encourage students to eat breakfast at home or at school.

Toner, C. (1999). *Relationship between calcium intake and meal location among fourth-, fifth-, and sixth-grade African-, Euro-, and Hispanic-American children*. Unpublished master's thesis, Texas Woman's University, Houston.

The purpose of this study was to examine the relationship between calcium intake and meal location, grade level, gender, and ethnicity, among fourth- to sixth-grade students. Two 24-hour food records were collected from each student. Ethnic distribution of the 215 students was 25% African-American, 29% Euro-American, 37% Hispanic-American, and 9% other ethnicities. There were 42% boys and 58% girls, 38% in fourth grade, 31% in fifth grade, and 31% in sixth grade. Calcium intake (but not density) was lower at restaurants (70 mg) than at home (297 mg) or at school (201 mg). There were no grade level differences in calcium intake or density. Boys consumed more calcium (616 mg) than girls (535 mg), but not higher calcium density (402 mg/ 1000 calories and 378 mg/ 1000 calories, respectively). For all locations combined, African-Americans consumed less calcium and lower calcium density (474 mg, 346 mg/ 1000 calories) than Euro-Americans (644 mg, 430 mg/ 1000 calories). Both African-American (247 mg, 179 mg/ 1000 calories) and Hispanic-American (248 mg, 162 mg/ 1000 calories) students consumed less calcium and lower calcium density at home than Euro-American students (364 mg, 246 mg/ 1000 calories). Significance was defined at $p < .05$. This study recommended interventions include information about various calcium-rich foods, especially in restaurants.

Nutrition Education

Serrano, E. (2001). *Development and evaluation of a bilingual computer nutrition education program for Latino children*. Unpublished doctoral dissertation, Colorado State University, Fort Collins.

The purpose of this research was to develop and evaluate a bilingual computer nutrition program for low-income Mexican American children in Colorado. This research project spanned all levels of software development with formative evaluation, product development, and impact evaluation. Development of the CD-ROM program was driven by several theoretical models and results from the formative evaluation. The formative evaluation included focus groups with children (n = 52) and surveys with classroom teachers (n = 42) and media teachers (n = 12) in order to determine preferences for computer programs, particularly in classroom settings. The evaluation also sought to address dietary acculturation in the program. Food frequency questionnaires and acculturation scales were administered to children in largely Hispanic areas of Colorado. Several foods were found to be sensitive to change and sensitive to adoption with increasing acculturation. The final computer program contained a total of six components – including educational modules, games, songs, and infomercials – focusing on the Food Guide Pyramid and related topics. Foods included in the program were representative of different levels of acculturation (as determined by the dietary acculturation study). Online evaluation was used to measure gains in knowledge, attitudes, and behavior intentions, as well as dietary choices. The program was implemented in a total of four southern Colorado schools – two intervention schools (n = 63) and two matched control schools (n = 52). The computer nutrition education program was highly effective in improving knowledge about the Food Guide Pyramid. The intervention group's knowledge of the Food Guide Pyramid increased by over 50% and was considered significantly higher than the control group at the $p < .01$ level. Self-efficacy related to using the Food Guide Pyramid to plan meals and snacks also increased significantly. Findings demonstrated that games and songs were effective in strengthening knowledge about nutrition and the Food Guide Pyramid, regardless of acculturation level and language of program. Online data about dietary patterns confirmed findings from the preliminary dietary acculturation study.

Lauchu, J. J. (2001). *Development of a science-based nutrition curriculum for high school students.* Unpublished master's thesis, Eastern Michigan University, Ypsilanti.

This study describes an evaluation of gains in student knowledge and comprehension of nutrition information following presentation of a nutrition course that was developed using a science-based foundation and a modified knowledge, attitude, and behavior teaching model. The course, entitled "Nutrition Metabolism and Disease," was implemented in the 1999/2000 school year for high school students (grades eleven and twelve, n=66). A Nutrition Achievement Test was used for testing that consisted of 70 questions in three areas of knowledge: body image and weight, consumer issues, and principles of nutrition. Tests examining mastery of subject matter were administered at the beginning and again at the end of an 18-week semester. Upon completion of the course, posttest scores revealed an average increase in the three areas as follows: (a) body image and weight $5.8 \pm 1.5\%$, (b) consumer issues $9.1 \pm 0.9\%$, and (c) principles of nutrition $12.3 \pm 1.0\%$.

Morris, J. L. (2000). *The development, implementation, and evaluation of a garden-enhanced nutrition education program for elementary school children.* Unpublished doctoral dissertation, University of California, Davis.

The objective of this research was to develop a comprehensive nutrition curriculum designed to improve the nutrition knowledge and vegetable preferences of school-aged children. A pilot study was conducted to evaluate the initial feasibility of implementing and evaluating a garden-enhanced nutrition education program within a school setting. This study was conducted with first graders from both a control and intervention site (n=98). Results showed a significant improvement in the intervention site students' willingness to taste vegetables. The researcher concluded that it was possible to implement and evaluate such a program within school-year constraints. The second step was to develop a comprehensive curriculum and appropriate assessment tools. The curriculum was developed around the Social Cognitive theory and consisted of nine nutrition lessons with complementary gardening activities. The curriculum was repeatedly field-tested in several upper-elementary grade classrooms and revised until no further changes were necessary. A nutrition knowledge questionnaire and a vegetable preference survey were also developed. The knowledge questionnaire had a reliability coefficient of 0.81, and the preference survey was determined to be age-appropriate. The final step was to formally evaluate

the curriculum using the tested assessment tools. Students from three schools in nine fourth-grade classrooms participated in this study (n=215). One school was designated as the control site and received no formal nutrition or gardening education. Another school was designated as the classroom-based nutrition education site (CBNE) and received only the in-class nutrition lessons. The third school was designated as the garden-based nutrition education site (GBNE) and received both the in-class nutrition lessons and the garden activities. Results showed a significant improvement in nutrition knowledge of students at the CBNE and GBNE sites. Students receiving only classroom-based nutrition education improved their preferences for carrots and broccoli, while GBNE students improved their preferences for carrots, broccoli, zucchini, and snow peas. Most improvements were retained at the six-month follow-up. The researcher concluded a garden-enhanced nutrition education curriculum was an effective tool for improving the nutrition knowledge and vegetable preferences of elementary school-aged children.

Kret, L. A. (2000). *Nutrition education in grade K-7: A comparison of suburban public and nonpublic schools.* Unpublished master's thesis, Eastern Michigan University, Ypsilanti.

The two purposes of this study were to determine if schools in suburban school districts taught nutrition at the elementary school level and if differences occurred between public schools and nonpublic schools in the implementation of nutrition education. Two hundred and twenty-five surveys were sent to all school administrators in the county that taught kindergarten through seventh grade. The survey included questions about committees involved in nutrition education, grades in which nutrition was taught, integration of nutrition into other subjects, and resources used for nutrition information/education. Questions were tested for significance at the .05 level using the Pearson Chi-square test or the Fisher's Exact Test. Ninety-five percent of all schools that responded (n=90) taught nutrition in all grades with no differences between public schools and nonpublic schools. Curriculum committees were prevalent in 80% of the schools but only 13% of schools had health advisory committees. Nutrition education was integrated into other subjects in 92% of all schools. Public schools used the Internet more often than nonpublic schools to gather nutrition information (p=.04). Public schools used the state's curriculum framework (p ≤ 001) and the state's model for comprehensive school health education (p=. 038) more often than nonpublic schools to guide their curriculum committees in their work. Fifty-four percent of schools used textbooks that were one to three years old.

Chen, C. T. (1999). *The school lunch program as a vehicle for nutrition education in Iowa public schools.* Unpublished doctoral dissertation, Iowa State University, Ames.

The purpose of this study was to determine the extent to which the Iowa public school food service (SFS) district directors incorporated nutrition education into SFS programs. A preliminary qualitative study was conducted to obtain in-depth information about nutrition education in SFS programs. The resulting information from interviews with 12 private SFS directors was used to develop a self-administered questionnaire for this study. The questionnaire consisted of three parts: demographic information, nutrition education activities, and attitudes toward nutrition education. The questionnaire was pilot tested, revised, and mailed to 377 Iowa public SFS district directors. The return rate was 74% (n=280). The majority of respondents were female, between the ages of 40 and 59, had the job title of SFS director, and possessed the minimum of a high school diploma. Findings indicate that three major sources of nutrition education materials were commodity groups, state government, and the US Department of Agriculture. Nutrition education materials were received on a monthly basis. Posters, newsletters, brochures, and flyers were the most frequently used materials. Respondents performed most nutrition education activities with SFS personnel and students but seldom with nurses, principals, school boards, superintendents, other school administrators, teachers, and/or parents. Nearly half of the respondents used marketing activities to promote healthy eating habits and involved students in the preparation of nutritious meals in the school cafeteria. In general, respondents had positive attitudes toward nutrition education and recognized the importance of incorporating nutrition education into SFS programs. Results of the study indicated that Iowa public SFS district directors significantly differed in backgrounds, nutrition education activities, and attitudes toward nutrition education among small, medium, and large school

districts. The researcher concluded the results of this study could be used to enhance nutrition education in Iowa SFS programs.

Kimiywe, J. O. (1999). *The effect of peer-facilitated participatory nutrition education on acceptability of reduced-fat foods by 5th graders (children).* Unpublished doctoral dissertation, The Florida State University, Tallahassee.

This study examined the effects of a peer-facilitated nutrition education intervention on the acceptability of reduced-fat recipes by fifth graders (n = 323) at five elementary schools in Tallahassee, Florida. The design of the four-week study (February 25 to April 16, 1998), which focused on low-income populations, was based on social learning theory concepts. Of the five study schools, four were assigned to intervention schools and one served as control school. Nutrition knowledge, skill and self-efficacy were assessed at baseline and at program end in all the study schools. Graphic presentations and cooking demonstrations were used to promote the reduced-fat recipes, after which taste-tests were administered to assess acceptability. Analysis of variance with paired and multiple comparison tests were used to test for differences among schools. Chi-square with cross-tabulations was used to identify significant associations between socio-demographic characteristics of students at baseline and gains in scores between baseline and program end. A process evaluation was administered to assess the student and teacher satisfaction with the program activities. Significant improvements in knowledge and skill but not self-efficacy were noted at the intervention schools. A slight but significant difference was observed in acceptability of reduced-fat recipes among children of intervention schools compared to control school children. Process evaluation data indicated enthusiasm for the program among students and teachers. The strengths and limitations of the study were discussed and recommendations were made for improvement of similar programs in the future.

Student preferences

Brown, D. M. (2000). *The effect of ethnicity, gender, and location of meal on the frequency of beverage consumption in 4th, 5th, and 6th graders.* Unpublished master's thesis, Texas Woman's University, Houston.

The purpose of this study was to determine whether dietary differences among ethnic groups, grade level, gender groups, and meal location could be observed in beverage consumption. Beverage consumption was obtained by analyzing the seven-day food records for 289 subjects. Beverage consumption was analyzed according to ethnic group, gender, grade level, and location of meal. Mexican-American (MA) children had the highest soda consumption overall and at all locations of meal consumption. Euro-American (EA) children had the highest milk consumption overall and at home. African-American (AA) children had the highest non-juice drink consumption overall and at school. No significant differences were identified in beverage consumption by gender. Soda consumption increased with age; milk consumption decreased with age.

Lambert, L. G. (2000). *The relationship between parents' behavioral intentions to encourage their lower elementary school-aged children to participate in the National School Lunch Program and their children's actual participation.* Unpublished doctoral dissertation, The University of Southern Mississippi, Hattiesburg.

The purpose of this study was to identify the relationship between parents' intentions to encourage or not encourage their elementary school-age children to participate in the National School Lunch Program (NSLP) and their children's actual participation. The researcher used the Theory of Reasoned Action (TRA) to provide a guide for this study. Beliefs were elicited from parent focus group discussions and then used to develop a survey instrument which was identified as the Parent School Lunch Survey (PSLS). The PSLS was used to quantitatively measure behavioral and normative belief constructs of parents of elementary school children

toward the NSLP. The PSLs also measured parents' attitude, subjective norm, and intention toward encouraging their children to participate in the NSLP. Fourteen elementary schools located in the Southeast region of the U.S. participated in the study. Each school distributed 25 surveys per grade in kindergarten through third grade. A total of 1039 parents completed the PSLs with 960 (92%) giving their approval for the researcher to obtain their children's school lunch participation records for a period of one month. Data analysis revealed a significant correlation between the behavioral beliefs construct and attitude ($r = .49, p < .01$) and between the normative beliefs construct and subjective norm ($r = .26, p < .01$). With intention, there was a significant relationship between the attitude toward the behavior and subjective norm with 39% of the variance in intention explained. Also, there was a significant correlation with intention of participation ($r = .58, p < .01$) with intent accounting for 35% of the variance in participation. There was no significant correlation between students' grade level or gender and parents' intentions. Also, there was no significant correlation between students' grade level or gender and participation in the NSLP. When beliefs that guide parents' intentions to influence their children's participation in the NSLP are identified, then marketing strategies using persuasive messages in support of the NSLP can be developed. Results of this study provided helpful information for developing marketing strategies geared toward parents' beliefs which may increase their intentions to encourage their children to participate in the NSLP.

Thackeray, R. (2000) *The impact of a social marketing campaign on increasing fruit and vegetable consumption among middle school adolescents.* Unpublished doctoral dissertation, The University of Utah, Salt Lake City.

The purpose of this study was to examine the effect of social marketing on fruit and vegetable consumption among adolescents in the Salt Lake City School District. A school-based social marketing campaign compared a 5 a Day curriculum-only intervention to no-intervention. Other study variables included self-efficacy, asking behaviors, knowledge, availability, presentation, and preferences for fruit and vegetables. The effect of the interventions on fruit and vegetable consumption, self-efficacy, and knowledge among parents and faculty at the three schools was also examined. The study involved seventh- and eighth-grade students, parents, and faculty associated with Northwest Middle School (social marketing intervention, $N = 177, 89, \text{ and } 22$ respectively), Bryant Intermediate School (curriculum-only comparison group, $N = 166, 77, \text{ and } 16$ respectively) and Glendale Middle School (no intervention comparison group, $N = 165, 92, \text{ and } 21$ respectively). Students completed a 63-item questionnaire, parents completed a 34-item questionnaire, and faculty completed a 15-item questionnaire. Nonparametric tests were selected for pretest to posttest analyses since the data represented ordinal measures. Specific analyses included the Kruskal-Wallis one-way analysis of variance, Wilcoxon signed ranks, Mann-Whitney U, McNemar, Fisher's exact, and Spearman's rank-order tests. Although changes in overall fruit and vegetable consumption among students was limited to choosing more fruit at lunch, a total of 18 other significant changes from pretest to posttest were noted in the social marketing intervention among students, parents, and teachers. Actual consumption of fruit and vegetables was higher in the curriculum-only comparison group. Results of this study suggested that a multi-component intervention that combines cognitive approaches with social marketing-based environmental and policy changes may be more effective in changing fruit and vegetable consumption than either strategy alone. This study also suggested that social marketing effectively influences secondary target audiences.

Yoon, B. J. H. (2000). *The brand-name fast food study: Nutritional impact of brand-name fast foods offered in the School Lunch Programs.* Unpublished doctoral dissertation, Purdue University, West Lafayette.

The purpose of this study was to determine the nutritional impact of brand-name fast food service as part of school lunches on students' lunch intake at Indiana schools. Three separate studies were conducted to assess the impact of brand-name fast food service on nutritional content of, consumption of, and participation in school lunches, assuming that the impact on these three areas could affect the overall nutritional quality of students' lunch intake at schools. Results of the study indicated the nutritional content of brand-name fast foods varied widely by types of foods as well as by brands. Elementary students tended to consume about the same amounts

of foods, and high/secondary students tended to consume about the same percentages of foods whether the foods were brand-name fast foods or school-prepared foods. In the schools offering brand-name fast foods solely as part of school lunches (i.e. not offering them as a-la-carte items), the average school lunch participation rate was significantly higher when brand-name fast foods were offered than when school-prepared entrees were offered. In the schools offering brand-name fast foods solely as a-la-carte items, the average school lunch participation rate was significantly lower when brand-name fast foods were offered than when they were not offered. In the schools offering brand-name fast foods both as part of school lunches and as a-la-carte items, the average school lunch participation rates were not significantly different between days when brand-name fast foods were offered and the days when they were not offered. On average, schools serving brand-name fast foods did not have significantly different school lunch participation rates than those not serving brand-name fast foods. However, the average school lunch participation rate of the schools serving brand-name fast foods solely as a-la-carte items was significantly lower than that of schools not serving brand-name fast foods at all.