

SECOND SERVINGS AND A LA CARTE SALES TO ELEMENTARY CHILDREN IN THE  
NATIONAL SCHOOL LUNCH PROGRAM AND POTENTIAL IMPLICATIONS FOR  
CHILDHOOD OBESITY

by

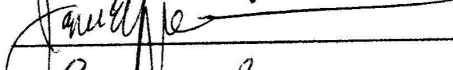
Amanda J. Wilder  
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George Mason University  
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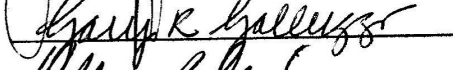
Committee:



Chair







Program Director



Dean, College of Education  
and Human Development

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A Dissertation submitted in partial fulfillment of the requirements for the degree of  
Doctor of Philosophy at George Mason University

By

Amanda J. Wilder  
Master of Education  
George Mason University, 2001

Director: Penelope Earley, Professor  
College of Education and Human Development

Fall Semester 2012  
George Mason University  
Fairfax, VA

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## **DEDICATION**

This dissertation is dedicated to my wonderful, supportive family. To my husband, Roger, who put up with evenings away from family, I thank you for your support and efforts to keep me on the path to success. To my son, Eli, who has such a great sense of humor and referred to this dissertation as my 'disorientation', thank you for letting me miss a little bit of your childhood to finish this incredible challenge. Finally, to my son, Ethan, who came far too early, but taught me that I can do anything if I only work hard and ask for help from my family and friends, I thank you for teaching me the value of family and love.

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## **LIST OF ABBREVIATIONS**

BMI – Body Mass Index, ratio of height to weight

IOM – Institute of Medicine

LEA – Local Education Association

NSLP – National School Lunch Program

Obese – BMI rate greater than 95%

Overweight – BMI rate between 85-95%

SFA – School Food Authority

SY – School Year

## **ABSTRACT**

### **SECOND SERVINGS AND A LA CARTE SALES TO ELEMENTARY CHILDREN IN THE NATIONAL SCHOOL LUNCH PROGRAM AND POTENTIAL IMPLICATIONS FOR CHILDHOOD OBESITY**

Amanda J. Wilder, Ph.D.

George Mason University, 2012

Dissertation Director: Dr. Penelope Earley

The sale of second servings and/or a la carte purchases made by elementary students participating in the National School Lunch Program (NSLP) was investigated in this mixed methods case study. The percentage of elementary students in one school district who purchase second servings and/or a la carte items, in addition to the regularly purchased school lunch, was assessed with data disaggregated based on age and demographics. In addition, five cafeteria managers were interviewed about the process of selling extra food items to elementary age children. Results of this study indicate that a la carte sales at the elementary level are significant, with 29.53% of the elementary population purchasing a la carte food items during the period studied. In addition to a la carte sales, 18-369 second servings of main entrée items were sold each day. Additionally, interviews with

cafeteria managers indicated the importance of having and offering a variety of food choices to children to supplement the budget. These extra food items are a hidden phenomenon within the NSLP and the implication of the additional daily calories on childhood obesity should be carefully considered in future revisions of the Healthy, Hunger-Free Kids Act of 2010.

## CHAPTER 1

### INTRODUCTION

Childhood obesity has grown exponentially in the past 30 years, and more recently has become a highly commercialized topic, with multiple news reports and efforts by popular television personalities and reality shows to improve the quality of food served in America. Examples include the television show *Jamie Oliver's Food Revolution*, as well as the movie *Supersize Me* (Spurlock, 2004). Additionally, in November 2009, President Obama created a Childhood Obesity Taskforce, and in February 2010 First Lady Michelle Obama initiated the *Let's Move* Campaign. Also in 2010, the United States Senate and House of Representatives passed the Healthy, Hunger-Free Kids Act of 2010, which received the President's signature in December (P.L. 111-296, 2010). This legislation requires a change in school nutrition and physical education requirements, and is supposed to provide additional funding per child for school lunches sold in participating schools.

In January 2012, the United States Department of Agriculture (USDA) released new standards for foods served to children in the National School Lunch Program (NSLP). These standards include serving more fruits and vegetables, offering more whole grains, reducing the fat percentages in milk served, and limiting calories and serving sizes based on children's age (U.S. Department of Agriculture,

Office of Communications, 2012). These new changes will begin during the 2012-13 school year, and allow three years for full implementation. The projected cost to implement these new changes is more than \$3 billion over five years. All of the above endeavors were reportedly created in order to reverse the childhood obesity epidemic within one generation.

This study addressed the sale of extra food items to elementary school children who participate in the NSLP. What follows is a brief history of the NSLP, its growth and development, and changes made over time. This brief background provides a historical focus regarding the reasons why this food program was developed and its potential impact on children's health. This chapter includes current reported rates of childhood obesity in the United States, a brief descriptor of the dangers and implications of childhood obesity, and reflects upon how schools have become a central focus for policymakers as a means to reduce the childhood obesity epidemic. This chapter will conclude with a conceptual framework that helped frame the underlying foundation of this research project, as well as a possible method of reducing the childhood obesity rate within the current parameters of the NSLP.

### **Feeding America's Children**

In the late 1800's and early 1900's, charitable organizations began providing sporadic meal service to impoverished youth in many U.S. city schools, including those in Boston, Philadelphia, Milwaukee, St. Louis, Cincinnati, Cleveland, Chicago, Los Angeles, and New York (Gunderson, 1971). In addition, many schools in rural

areas attempted to help feed children because traveling home during lunchtime was not an option due to the vast distance many children traveled to school each day. Many educators recognized the need to feed children living in poverty, and began to take over the responsibility of feeding hungry children from the volunteer organizations that started the process. The depression, however, created a massive population of children who could not afford lunch, and a surplus of farm products without a market (Gunderson, 1971). This resulted in the creation of Public Law 74-320, entitled the Agricultural Adjustment Act Amendment of 1935.

Funds for Public Law 74-320 were provided by taking 30% of the “gross receipts from duties collected under the customs laws during each calendar year” (Gunderson, 1971, p. 15). The money was to be used to encourage the purchase of surplus farm commodities to give to the schools to feed needy children. An increasing number of children received school lunch, and farmers were able to sell their products at a fair cost; however, the beginning of World War II changed the National School Lunch Act significantly. No longer was farm commodities surplus an issue, because most extra food went to the soldiers, and any labor for the school lunch programs as created by the Works Project Administration was eliminated. Between 1942 and 1944 food available for the school lunch program dropped from 454 million pounds to 93 million pounds, serving approximately five million children, which was a reduction from six million before the beginning of the war.

### **The National School Lunch Act of 1946**

In 1946, the 79<sup>th</sup> Congress introduced legislation to give this program

permanent status, and the authorizing legislation became known as the Richard B. Russell National School Lunch Act, with the purpose to “safeguard the health and well-being of the Nation’s children and to encourage the domestic consumption of nutritious agricultural commodities and other food” (Gunderson, 1971, p. 19). If schools wished to receive funding, then they were required to meet the minimum nutritional standards set forth in the Act. There were three different nutritional variations that could be followed: Type A, Type B, and Type C. All of the meals included eight ounces of milk, but the Type A meal was designed to meet at least one-third of the minimum nutritional requirements of a child ages 10-12, and Type B was a supplementary option if the school did not have the facilities to prepare a Type A lunch (Gunderson, 1971, p. 20-1).

**USDA Funding.** The National School Lunch Program (NSLP) has a funding stream in Section 32 which “allows for the equivalent of 30 percent of annual customs receipts to support the farm sector through a variety of activities” (USDA FNS, *USDA foods*, 2010, p. 6). This percentage equaled over \$7.5 billion in 2008. A portion of that money is required to be used to purchase surplus farming commodities (See Figure 1.1). Within Section 32, there is one account to be used for entitlement purchases, and another for bonus purchases. When making entitlement purchases, the

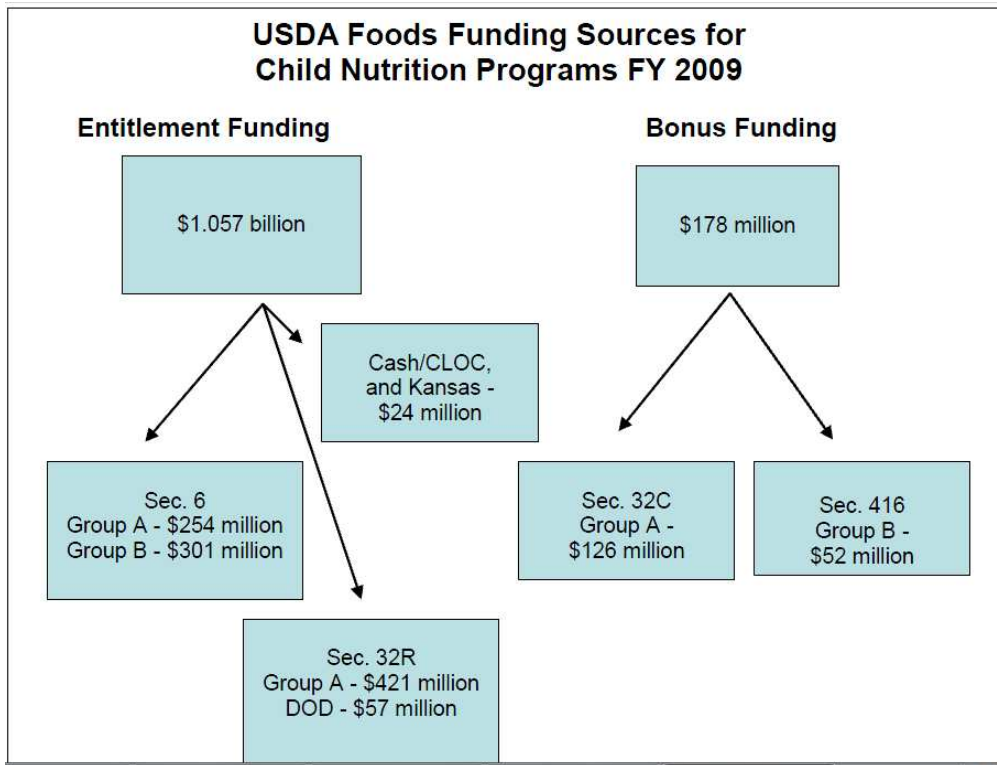
USDA consults with various groups inside and outside of USDA, and devises, in early spring, a purchase plan for the next school year. The plan is based on consultation with a range of stakeholders inside and outside of USDA, prior



year purchases, likely school needs, expectations of available funds, and any anticipated surplus or other market conditions in the coming year, among other considerations. (USDA FNS, *USDA foods*, 2010, p. 6)

In addition, no less than \$50 million must be used annually to purchase fresh fruits and vegetables for school lunch programs and other eligible institutions. The Department of Defense is currently the procurement agent for all of those purchases.

Bonus purchases (32C Funds) are required in order to purchase items quickly in the marketplace. Often, these purchases are made after approval by the Secretary of Agriculture “at the request of industry groups, after USDA has conducted a careful analysis of the need to provide market assistance to a specific product” (USDA FNS, *USDA foods*, 2010, p. 6). As indicated in the funding flowchart in Figure 1.1, many of these bonus purchases are given to school nutrition programs, and have totaled “anywhere between \$11 million to \$126 million depending on the need to remove surplus product from the marketplace (p. 6).



SOURCE: USDA FNS, *USDA foods*, 2010, page 8.

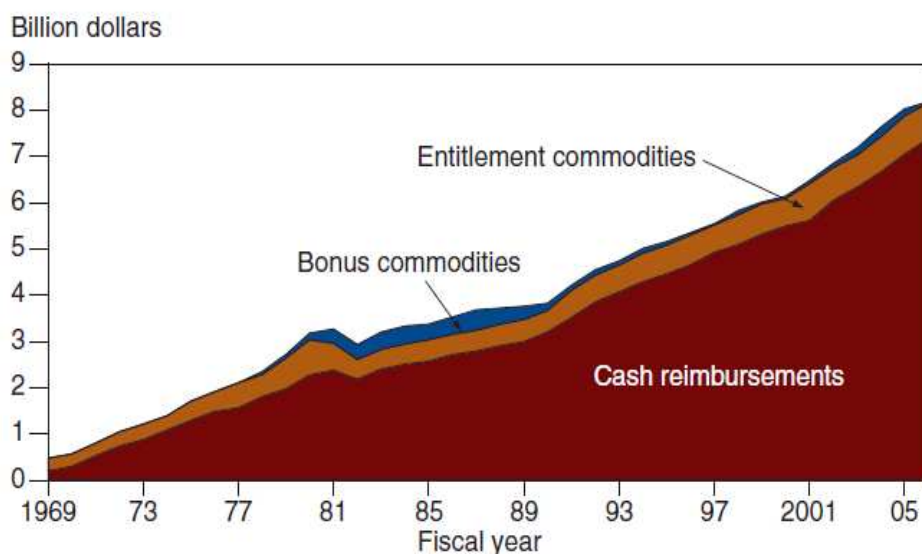
*Figure 1.1. 2009 Entitlement and Bonus Funding Allocations*

In 1962, the National School Lunch Act was amended to correct funding disparities based on the needs of the states. In addition, the National School Lunch Week was established beginning the second Sunday of each October. Four years later, the Child Nutrition Act of 1966 was enacted, with its purpose also defined as safeguarding the nutrition of children and to “encourage the domestic consumption of agricultural and other foods” and added specific milk and breakfast programs (P.L. 89-642, 1966, p. 2-2). Then, in 1969, the Food Nutrition Service was added to the United States Department of Agriculture in order to run federal food programs,

including the school lunch program.

In the 1980s, Congress attempted to reduce the budget for the school lunch program for the first time by approximately one billion dollars; however, the end result would have been designating ketchup and pickle relish as vegetables to offset the budget deficit (Haskins, 2005). It had been recommended to allow the tomato sauce used to make ketchup, and the pickled cucumbers used to make relish, to count as a vegetable serving in order to reduce the budget for the NSLP by 25%. Public shock and disapproval prompted the Reagan administration to “quickly put the billion dollars back into the program” (Haskins, 2005, p. 13). In the 1990’s, Republicans attempted to consolidate the food programs and reduce the funding allotment for the NSLP, but this effort also failed. Other than those two attempted instances to reduce funding, the amount of money allotted for the National School Lunch Act has increased each year (See Figure 1.2) by approximately 4.8% (Ralston, Newman, Clauson, Guthrie, & Buzby, 2008, p. 16).

## NSLP costs, 1969-2006



Source: Ralston, K., Newman, C., Clauson, A., Guthrie, J., & Buzby, J., 2008, p. 17.

*Figure 1.2.* National School Lunch Program (NSLP) Funding Chart

### School Eligibility

Any private or public school is eligible to participate in the School Lunch Program if it “serves lunches that meet Federal requirements, and ... offer free or reduced price lunches to eligible children” (USDA, Fact Sheet, 2010, p. 1). Schools that do participate receive cash subsidies, as well as donated food items that are farming surplus commodities, to feed more than 33 million children each day (Food Research & Action Center, 2009). If a school has a free/reduced population of less than 60%, they receive \$2.72 per every free lunch served, \$2.32 for each reduced lunch sold, and \$0.26 for any paid lunches sold. Schools with more than a 60% free/reduced population receive higher rates of reimbursement.

## **Student Eligibility**

Any student who attends a school participating in the National School Lunch Program is eligible to purchase any meal sold. “Children from families living below 130 percent of the poverty level are eligible for free meals. Children from families with incomes between 130 percent and 185 percent of the poverty level are eligible for reduced-price meals” (USDA, Fact Sheet, 2010, p. 1). This means that if a family of four makes less than \$28,665, their children are eligible to receive free breakfast and lunch at a participating school.

## **2004 Reauthorization of the National School Lunch Act**

Congress reauthorized all of the federal child nutrition programs in 2004, including the school lunch and breakfast programs, based on Government Accountability Office (GAO) reports that describe the need for improved school nutrition and school food safety. President Bush signed the Child Nutrition and Women Infant Children (WIC) Reauthorization Act of 2004 into law on June 30, 2004 (Public Law 108-269). This Act amended and combined the Richard B. Russell National School Lunch Act and the Child Nutrition Act of 1966. It included the provision of nutrition promotion in the school setting, as well as the requirement of school wellness policy development for any school participating in the NSLP.

## **Nutritional Components**

The 2004 amendments added Nutrition Promotion as a component of the School Lunch Act. Funding was created and set aside for schools to “disseminate

and use nutrition messages and material developed by the Secretary” (Public Law 108-265, p. 731). There was nothing specific, however, that delineated what those messages and materials might include. Simply put, school cafeterias that receive USDA funding were now required to promote the sale of school meals and would receive funding of one-half cent per meal sold for promotions.

Nutritional Requirements, as set forth in the Child Nutrition and WIC Reauthorization Act of 2004 include specifying the types of milk to be sold in school cafeterias, as well as appropriate substitutes for students who are medically unable to drink milk. Beginning in school year 2004-05, school food services were required to begin “to increase the consumption of foods and food ingredients that are recommended for increased serving consumption ... in the National Nutrition Monitoring and Related Research Act of 1990” (Child Nutrition and WIC Reauthorization Act of 2004, p. 732). Additionally, within two years of this Act, rules about the specific serving and meal recommendations were to be completed and disseminated by the Secretary of Agriculture to align with this Act as well as the Child Nutrition Act of 1966.

### **School Wellness Policies**

A requirement of the Child Nutrition and WIC Reauthorization Act of 2004 is that schools were required to write a wellness policy, beginning with the 2006-07 school year. Parents, students, school board and administrative staff, as well as food service employees were listed as required team members who were asked to write the local school wellness policy for each district. The wellness policy was required

to address goals for nutrition education, physical exercise, and any other activity that would “promote student wellness” (Child Nutrition and WIC Reauthorization Act of 2004, p. 780). More specifically, the nutritional guidelines that were required to be in the wellness policy had to specifically promote “student health and [reduce] childhood obesity” (p. 781). In addition, a plan to measure each school district’s ability to implement the wellness policy at the school level was a policy requirement.

### **Richard B. Russell National School Lunch Act**

The Healthy, Hunger-Free Kids Act of 2010, reauthorizing the Richard B. Russell National School Lunch Act, is one method currently claiming to address childhood obesity in American schools. U.S. Agriculture Secretary Tom Vilsack issued a statement on December 13, 2010 after President Obama signed the Healthy Hunger-Free Kids Act.

Today is a great day for kids throughout our country as they will soon have healthier, and more nutritious food in their schools. As we continue to focus on the twin issues of childhood obesity and hunger, we will increase access to good, quality meals in school cafeterias so the nutritional needs of our youngsters are better met. The President and First Lady have advocated strongly for passing the Healthy, Hunger-Free Kids Act of 2010, and, this bill, along with the resources and the powers provided under it, are going to allow USDA to be much more effective and aggressive in responding to

obesity and hunger challenges for America's kids. (The White House, Office of the Press Secretary, 2010, para. 1)

More support for the Act came from U.S. Secretary of Education Arne Duncan,

The Healthy, Hunger-Free Kids Act makes the most significant investment in the National School Lunch program in more than 30 years. I look forward to continuing to work with the First Lady and Secretary Vilsack to combat our national childhood obesity epidemic and increase students access to the nutritional food they need to help them learn. (The White House, Office of the Press Secretary, 2010, para. 3)

Secretaries Vilsack and Duncan, as well as other top U.S. officials, have explicitly stated that the newly enacted Healthy, Hunger-Free Kids Act of 2010 is expected to improve the health of children who eat meals in the school setting, as well as reduce childhood obesity.

### **Childhood Obesity**

Overweight and obesity rates have risen worldwide during the last thirty years, currently affecting 1.5 billion adults and 43 million children, reaching epidemic proportions according to the World Health Organization (WHO, 2011). Of special importance is the rising rate of obesity in children due to the associated health implications. Obesity rates in children living in the United States have tripled, and health problems associated with obesity, such as Type 2 Diabetes, heart disease, and high blood pressure are affecting children in greater numbers. The Centers for Disease Control and Prevention (2008) defines obesity by using body

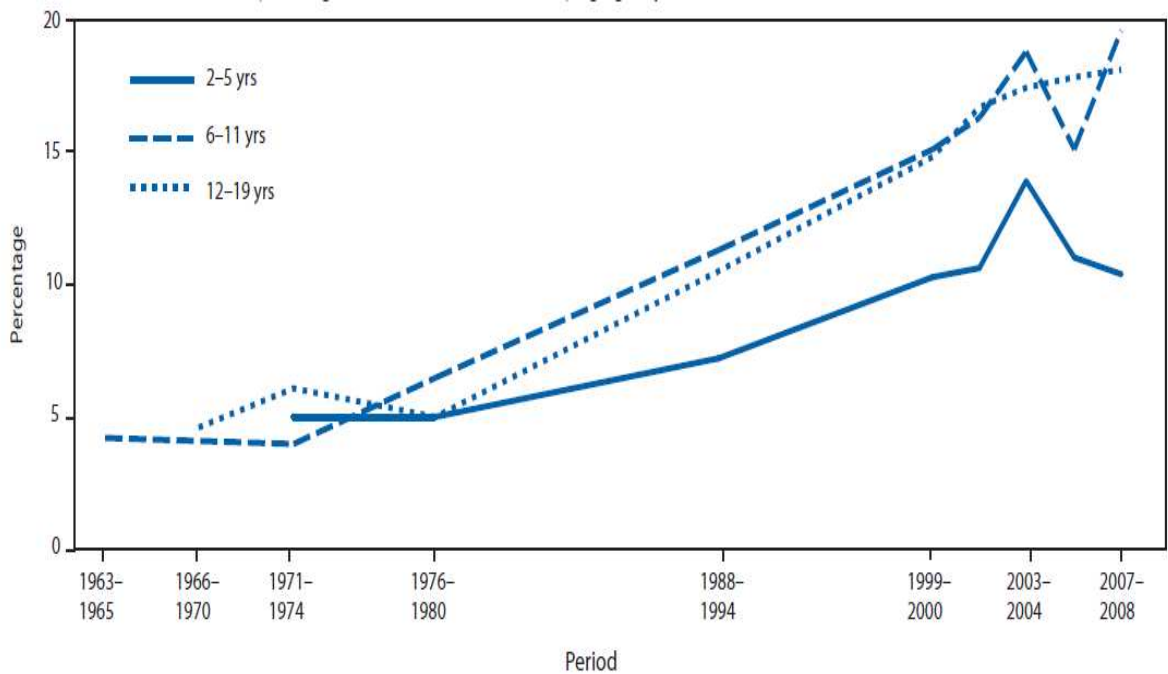


mass index (BMI). It is a measure of weight in pounds (or kilograms) in relation to height in inches (or meters). Children who are considered overweight are those with a BMI score that falls at or above the 85<sup>th</sup> percentile and children who are obese have BMI scores at or above the 95<sup>th</sup> percentile.

In addition to health concerns facing obese children during their childhood is the challenge of lifelong health. Whitaker, Wright, Pepe, Seidel, & Dietz (1997) found that 80% of children who were overweight at ages 10-15 years continued to be obese at age 25 years. More recently, The, Suchindran, North, Popkin, and Gordon-Larsen (2010) completed a 13 year study and confirmed that obesity in adolescence continues to predict obesity into adulthood, and “...less than 5% of individuals who were at a normal weight in adolescence became severely obese in adulthood” (p. 2045). It is worrisome that “American society has become 'obesogenic,' characterized by environments that promote increased food intake, nonhealthful foods, and physical inactivity” (Centers for Disease Control and Prevention, 2011).

This obesogenic attitude has resulted in approximately 19.6% of children ages 6-11 to be considered obese and 35.5% are considered overweight. Those rates continue to rise, as illustrated in Figure 1.3; however, more alarming is that children from low socioeconomic (SES) households, and/or minorities are more likely to be obese and overweight (Ogden, Carroll, Curtin, Lamb & Flegal, 2010; Waters, Ashbolt, Gibbs, Booth, Magarey, Gold, Lo, Gibbons, Green, O'Connor, Garrard & Swinburn, 2008). Because schools are already tasked with handling the

educational needs of children from minority and low SES backgrounds per the No Child Left Behind (NCLB) Act (U.S. Department of Education, 2008), it could be perceived by parents and educators that the health needs of those same children at risk should be addressed in the school setting where they spend the majority of each day.



Source: Bell & Rogers, 2011, p. 42.

*Figure 1.3.* Overweight and Obesity Rates of 2-19 year olds in the U.S.

## **Statement of the Research Problem and Purpose**

Because approximately 80% of overweight children tend to remain overweight as adults, closer scrutiny of extra food items served to children should be considered (The et al., 2010; Whitaker et al., 1997). Currently, the majority of schools are not serving children lunches that meet the Recommended Daily Allowance (RDA) of vitamins, nutrients, fruits, vegetables, and fat content (Gordon & Fox, 2007; Expectmore.gov, 2010). Additional concerns about increased federal spending on the NSLP, and the lack of financial accountability has many stakeholders upset that money is not being spent as intended to feed U.S. children as dictated by current USDA policy.

There is much debate and research about the nutritional quality of school lunches, and whether schools can afford to offer healthier foods on a regular basis; however, very few studies have investigated the sale of second servings and/or a la carte purchases made by students and its possible relationship to childhood obesity. There is very little written about the opportunities that elementary children have to purchase a complete second serving of the main entrée. Current practice allows for all elementary children to purchase extra food servings and a la carte each day, unless a school principal or cafeteria manager choose to modify or eliminate the sale of extra food items. This ambiguity about extra food opportunity and availability at the elementary level, as well as the lack of reporting to the public, were primary factors in the creation of this research project. Therefore, this study investigated the percentage of elementary students in one school district who purchased second

servings and/or a la carte items, in addition to a purchased school lunch, with data disaggregated based on grade level and school demographics. Overall, the purpose of this study was to assess how second servings and a la carte sales occur at the elementary school level in one school district.

### **Research Questions**

Childhood obesity is now considered an epidemic, one that the United States government is attempting to rectify within one generation; therefore, it necessitates a consolidated effort on the part of parents, schools, and localities to impact the needed legislative changes, policies, and reform. Knowing that children do not have enough Physical Education on a regular basis, do not eat enough fruits and vegetables, and that many parents lack knowledge about what constitutes healthy weight for their children, schools and cities in the U.S. are reviewing and considering possible changes in school and cafeteria policies. Childhood obesity is a pervasive, worldwide problem with potential implications for school cafeterias to bear some of the responsibility for providing healthy meals and appropriate portion sizes to children based on recent changes to the Healthy, Hunger-Free Kids Act of 2010; therefore, I investigated the following:

1. Are elementary students purchasing second servings of main entrées and/or a la carte food items during lunch? If so, how often?
2. What extra food items are children in elementary schools purchasing in school cafeterias?

3. Are second serving main entrées and/or a la carte items purchased at different rates based on grade level?

$H_{01}$ :  $\mu_1 = \mu_2$ ; Second serving purchases are not affected by student grade level.

$H_A$ :  $\mu_1 \neq \mu_2$ ; Second serving purchases are affected by student grade level.

4. How are cafeteria managers in the elementary schools of the selected school district implementing second serving and a la carte sales in the school setting?

### **Conceptual Framework**

Recently childhood obesity has become a highly commercialized topic, with multiple news reports and efforts by popular television personalities and reality shows to improve the quality of school food in America. Additionally, in November 2009, President Obama created a Childhood Obesity Taskforce, and in February 2010 First Lady Michelle Obama initiated the “Let’s Move” Campaign. More recently, the Senate and House passed the Healthy, Hunger-Free Kids Act of 2010, which received the President’s signature in December of that year (P.L. 111-296, 2010). This legislation will require a change in school nutrition and physical education requirements, and provide additional funding for school lunches. All of these endeavors were reportedly created in order to reverse the childhood obesity epidemic within one generation.

The debate about setting, controlling and defining nutritional guidelines in public school meal programs lends itself to Kingdon's Multiple Streams framework (1995). Kingdon (1995) articulates the idea that policy change requires the convergence of three separate policy streams that converge and result in effective change. Timing is key, as are the three distinct streams that policymakers should consider when attempting to initiate any policy change. The problem stream consists of an issue that has risen to the level of a problem that is receiving notice by the public and is perceived as something that is wrong and can be corrected. The policies stream is the idea creation stage; whereby the potential solutions are not strictly tied to the problem at hand but are out in the stream waiting for a policy to match. The politics stream consists of a political event or consensus that draws attention to a topic and is a time when bargaining can begin in the political arena. These streams are continuously in motion, but when they converge an issue becomes transformed into an actual policy.

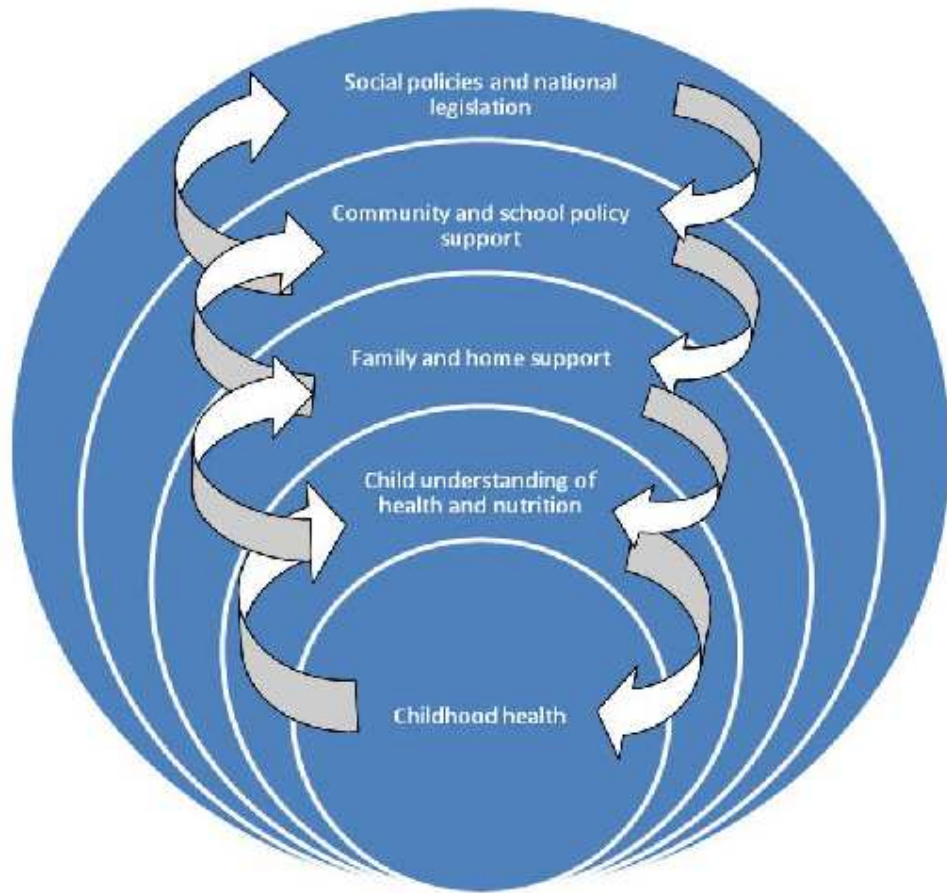
The intense focus on childhood obesity by the media would classify as a problem stream according to Kingdon (1995), and the newest focus of attempting to solve childhood obesity by creating the Childhood Obesity Taskforce and the Let's Move Campaign by President and First Lady Obama classify as the politics stream. Finally, the policy stream consists of the efforts by the House and Senate to pass the Healthy, Hunger-Free Kids Act of 2010 to define nutritional and exercise guidelines, as well as efforts by the USDA to limit the amount of 'competitive' foods that can be sold in schools during specific meal times. This convergence of policy, need, and

public interest has created a window of opportunity whereby true reform is more likely to result in policies that will actually address childhood obesity in the school setting.

In addition to Kingdon's model, childhood obesity also aligns with the co-construction perspective detailed by Datnow and Park (2009). It is important for policymakers and educators to work together to address childhood health and nutrition; however, it cannot be a one-way discussion, coming from the top levels of government down to the masses. Parents, teachers, and children must have the opportunity to be heard and interact with policymakers in order to "influence the implementation of reform" (p. 350). Otherwise, national guidelines will not likely have a universal effect on local communities. If childhood obesity is to become a priority that is addressed in the school setting, then all members of the political community will need to interact to make the best decisions for each school.

The co-construction framework representing childhood obesity is visualized in Figure 1.4 by the arrows of discussion and interaction traveling in multiple directions between all participants. This continual interaction must be a component of school nutrition policy because the simple act of developing a policy at the state or federal level does not give it value at the local level. The co-construction perspective aligns with the struggle to address childhood obesity because it does "not assume that policy is the only, or even major influence on people's behavior" (Datnow & Park, p. 352). This conceptual framework considers the culture of each

community and how all members of society must interact positively in order to create, implement, and sustain effective change in childhood health and nutrition.



Source: Adapted from “A Review of Risk Factors for Overweight in Preschool Children: A Policy Perspective” by S.S. Hawkins, & C. Law, 2006, *International Journal of Pediatric Obesity*, 1, 195-209. doi:10.1080/17477160600943351

*Figure 1.4.* Co-construction Framework Addressing Childhood Obesity Policy Implementation



## **CHAPTER 2**

### **REVIEW OF LITERATURE**

In order to truly understand the National School Lunch Act, and school lunch programs across America, fully exploring the history, development, and current structure of the NSLP system, as discussed in chapter one, details the original intent and need for the NSLP. Subsequent information in this chapter details current operational practice and evaluation of the program in order to understand the cost, efficiency, and potential barriers to change. A detailed overview of childhood obesity follows, as it relates to the public school setting in the United States as well as the International community. Fully exploring the rates of obesity and issues facing school children contextualizes the problem that policymakers face when determining how to address the obesity epidemic in the school setting.

#### **Program Evaluation of the National School Lunch Program (NSLP)**

##### **Evaluation of the 2005-06 School Year**

Gordon, Crepinsek, Nogales, and Condon (2007a) completed an evaluation for the USDA of school year 2005-06, entitled School Nutrition Dietary Assessment – III (SNDA-III). This evaluation generated multiple papers. They collected data from 129 School Food Authorities (SFA's), which consisted of a randomly selected sample of 398 schools. They surveyed 2314 children and their parents, the Food Service

Directors of each corresponding school district, and conducted follow up phone interviews. Additionally, school principals were interviewed. Their results indicated that only 58% of schools surveyed offered fresh fruits and vegetables every day. Two-thirds of schools served lunches that met nutritional standards, including those for protein, vitamins, and minerals; however, 80% of schools did not meet the reduced fat standard. There was a discrepancy in nutritional requirements between food items that were offered to children, versus those food items that were actually served to children from the lunch line. Schools are required to offer certain items, based on nutritional requirements set by the USDA, but do not have to actually serve those items to children on their lunch tray if children consider them undesirable when passing through the lunch line.

Gordon and Fox (2007) expanded upon the study above by focusing their summary analysis on competitive foods and dietary intake of children as determined by their recall of foods eaten the week prior to completing the survey. Their findings indicated that only six to seven percent of schools offered or served meals that met all of the Recommended Daily Allowance (RDA) standards. This was primarily due to two thirds of schools offering lunches that had more fat and saturated fat than was recommended, even though the number of schools meeting standards regarding the allowable amount of saturated fat doubled since 1998-99. Only 27% of schools offered the minimum standard of two fruit or vegetable options each day, “down from 37 percent at the time of SNDA-II” (Gordon & Fox, 2007, p. 8). In addition, only one-third to one-half of participating schools met the energy

standards for meals sold to children, and only five percent of schools offered or served foods made from whole grains. “On average, schools both offered and served lunches that contained about 34 percent of energy from total fat and about 11 percent of energy from saturated fat” (Gordon & Fox, 2007, p. 9). However, their analysis indicated that elementary schools are more likely to meet all of the standards than secondary schools.

Gordon, Fox, Clark, Nogales, Condon, Gleason, and Sarin (2007b) authored Volume II of the SNDA-III, focusing on student and parent data. Children in the study SFA’s were selected to complete a 24-hour dietary recall interview with their parents. Student data were collected from 2,709 students in 287 schools, within 94 SFA’s, and 2,330 interviews were completed with parents. In addition to the interviews, observers went to school locations and completed checklists of foods offered for sale “in the cafeteria, in vending machines, and in other in-school venues that compete with the NSLP lunch” (p. 16). Findings indicate that more boys than girls purchase school lunch and elementary students have a higher participation rate than other levels. Elementary students most often reported liking school lunch as the primary reason for purchasing school lunch; whereas, middle and high school students cited hunger and convenience as the primary reasons for purchasing school lunch. Additional findings about racial differences in lunch purchases reveal that Black and Hispanic students purchase school lunch at significantly higher levels than white students, at 32%, 20%, and 13%, respectively (Gordon et al., 2007b).

Additional analysis indicated that only 58% of schools offered fresh fruits and vegetables every day (Gordon et al., 2007b). Schools that offered the minimum standard of two fruit or vegetable options each day represented only 27%, “down from 37 percent at the time of SNDA-II” (p. 8). Two-thirds of schools served lunches that met nutritional standards, including those for protein, vitamins, and minerals. There was a discrepancy between many requirements that were offered versus those actually served. Schools are required to offer certain items in the lunch line, based on nutritional requirements, but do not have to actually place those items on the lunch tray if children consider them undesirable (Gordon et al., 2007b).

Expectmore.gov, a branch of Whitehouse.gov, analyzed the SNDA-III, and determined that the NSLP was moderately effective. This rating assessment was based on a 5% reduction in calories from fat served during school lunches between years 1993 and 1999, dropping to 34%. Additional accolades were bestowed upon the program based on short-term goals that made attempts to better track meal improvements. A major area of concern noted by Expectmore.gov was the lack of accountability for program eligibility. Many more children were approved to receive free and/or reduced meals than were legitimately entitled to, based on inaccurate application data.

**Certification requirements.** Certification is the process by which schools determine if a child is eligible for free or reduced meals. Ponza, Gleason, Hulse, and Moore (2007) utilized a multi-stage-clustered sample design of 87 SFA's, consisting of 256 public schools and 10 private schools. The primary study sample included

6,776 students eligible for free and reduced lunch, plus 1,038 students that did not qualify for free or reduced lunch during the 2005-06 school year. Additionally, a subsample of 2,950 students was surveyed. Data were collected in order to assess whether students were being correctly certified for free or reduced meals. Their findings indicate 22.5% of students were certified incorrectly, resulting in an over-certification rate of 15% and an under-certification rate of 6% (Ponza et al., 2007). Certification errors occurred more often for children applying for reduced fee lunches, with approximately 30% qualifying for reduced fees when they should have received free meals. Of those students who were denied benefits, one-third were incorrectly denied free or reduced meals when they were actually eligible to receive those benefits. These errors resulted in “gross erroneous payments due to non-certification error in the NSLP [of] \$555 million and accounted for 6.9 percent of the \$8.06 billion in NSLP reimbursements” (Ponza et al., 2007, p. 131).

### **Evaluation of the 2006-07 School Year**

In school year 2006-07, the dollars lost to certification error in NSLP represented \$1.449 billion, with an expected certification error rate of \$1.387 billion (Expectmore.gov, 2010). The target rate of verified applications that were not supported by adequate income verification was 27.5% in 2006 and 27.0% in 2007. The actual rates of inaccurate applications were 25.6% in 2006 and 24.4% in 2007. The target rate is set at 25.0% for 2011, which translates to one quarter of all verified applications expected to be incorrect. Errors in verifying income have resulted in similar trends of increased error in NSLP eligibility in 2006 and 2007

when the rate of error increased from 3.0% to 3.9%, with the expected error rates for those two years set at 3.4% and 3.3%, respectively.

**Funding and participation rates.** Another question assessed by Expectmore.gov (2010) was “Are funds (Federal and partners’) obligated in a timely manner, spent for the intended purpose and accurately reported?” (p. 12). The answer to that question was no; however, details about how money is being spent improperly were not included in the report. An additional component of the NSLP is the intended goal to increase NSLP participation each year. The number of students participating did increase from 54.6% to 54.9% between years 2006-07, which was within 1.5% of the intended target rate.

### **Evaluation in 2008**

Ralston, Newman, Clauson, Guthrie, and Buzby (2008) completed an Economic Research Report for the USDA detailing how commodities play a role in the NSLP and their potential impact on childhood obesity. They compiled and summarized recent studies, giving more weight to nationally represented samples and those that adhered to rigorous study standards. Their analysis revealed that USDA commodity purchases “represent 17 percent or less of the total food budgets of school food authorities on average” (p. 17), and the USDA can often purchase commodities at lower prices than those on the open market. Ralston et al. (2008) speculate that this amount could be enough to perhaps have a small effect on meals, especially if those food items differ significantly from what a school would typically purchase.

The intake of fat in school lunches has remained a concern for many policymakers; however, many schools have vending machines and a la carte items that do not meet any nutritional requirements set forth in the NSLP in order to generate extra income (Ralston et al., 2008). Some schools and localities are attempting to institute more stringent guidelines on those additional food items; however they still face the challenge of balancing budgets with what they believe will sell in a vending machine (p. 39). According to Ralston et al. (2008), the USDA appears to be lowering the fat content of food items sold to schools, as evidenced by the five percent increase in poultry items sold between 1996 and 2005.

Unfortunately, schools

face a 'trilemma' involving the meal's nutrition, student participation, and program cost. Improving the nutritional content of school meals may raise program costs, especially if it includes the necessary changes in food purchases, preparation, and marketing to prevent lower participation or higher plate waste. (Ralston et al., 2008, p. 39)

Another area of concern is the funding ratio of money given to school cafeterias, and the actual costs incurred. Bartlett, Glantz and Logan (2008) detail actual costs of operating a school cafeteria based on their study of 120 SFA's. The study sample of 353 schools consisted of interviews, surveys, and financial record reviews. Their results indicate that the cost of food constitutes almost half the allotted budget, with labor and facility expenditures accounting for slightly less than 45% of total expenses. Administrative costs are projected to be "an average of 20

percent of total labor costs, and 10 percent of total full costs” (p. vii). The USDA subsidizes approximately 51% of the cost to run a school cafeteria, based on 45% covering meal reimbursement and 5% from donated commodities. The average cost of producing a student lunch was \$2.79; however, the reimbursed rate in 2007-08 was \$2.51. Student payments from reduced/full price purchases total approximately 24%, and State and local funds provide about 9% of total revenue. The remaining revenue is covered by a la carte purchases and adult meals, resulting in most school cafeterias breaking even financially (Bartlett, Glantz, & Logan, 2008).

### **Evaluation in 2009**

Ranalli, Harper, O’Connell, Hirschman, Cole, Moore, and Coffee-Borden (2009), in a report to Congress about the direct certification process, detail the method of application and its level of success. They interviewed representatives from six States (Florida, Iowa, Kansas, New Mexico, Ohio, and Pennsylvania) and held roundtable discussions in five States (Florida, Iowa, Kansas, New Mexico, and Nevada). Additionally, two experts about the direct certification process, Christopher Logan and Zoe Neuberger, provided information for this report to Congress. Their results reflect the process of certification as most people filling out the paperwork, with income and household size as self-reported. Other families are directly certified, meaning their case numbers for alternative programs, such as the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), or the Food Distribution Program on Indian Reservations



(FDPIR), ensure immediate eligibility. In addition, foster children or those who are homeless also receive immediate eligibility.

The USDA has made direct certification a priority, and wants to increase the number of students who are directly certified each year to help reduce application error. In 2008-09, “77 percent of LEAs with fewer than 10,000 students did meet the SY 2008-2009 direct certification deadline” (Ranalli et al., 2009, p. 9). Ohio showed the most improvement, but still falls below the national average. The top three states in direct certification effectiveness, due to highest percentage of children who were directly certified, were Florida, Nevada, and New Mexico (p. 20). Reasons cited by states for difficulty in meeting this guideline were incorrect addresses, and other clerical issues that make matching data difficult. However, students are still eligible if their parents complete the application inaccurately, and schools are still reimbursed if children are not certified properly.

### **Evaluation in 2010**

The USDA staff completed a White Paper in May 2010, detailing how USDA foods are included in the National School Lunch Program (USDA FNS, *USDA foods*, 2010). This self-evaluation re-stated the purpose of the NSLP as serving a dual purpose to feed America’s children and donate USDA commodities to schools in order to feed children and help farmers. The rate of commodity use in schools was cited as 15-20% of daily lunches, with the remaining portion supporting commercial food industries with funding provided by the USDA, State and local funds, student purchases, and vending machine funds. Both perishable and non-perishable food

items were listed, as well as how different agencies purchase and distribute those products. Funding sources that support entitlements and bonuses were explained and detailed in the report. As described in Chapter 1, Section 6 entitlement funds of the National Lunch Act accounted for \$254 million dollars of perishable food items and \$301 million of non-perishable food items in 2009 Program (USDA FNS, *USDA foods*, 2010, p. 5). These funds do not have to be used on commodities, and are touted as allowing more flexibility to schools.

Section 32 funding of the National Lunch Act is more restrictive, and the “Secretary of Agriculture is required to use a portion of Section 32 funds to purchase surplus supplies of perishable foods” (USDA FNS, *USDA foods*, 2010, p. 6). The two accounts available in Section 32 are entitlement and bonus purchases. Groups, both in and outside of the USDA, plan entitlements (Section 32R) the spring prior to each school year. Expected funds and surplus commodities are considered, and almost half a billion dollars is set aside for school meal programs. Of that portion, “not less than \$50 million of this amount [must] be used each year to purchase fresh fruits and vegetables for distribution to schools” (USDA FNS, *USDA foods*, 2010, p. 6). Bonus purchases in Section 32C are made to “remove surplus product from the marketplace”, and are planned “often at the request of industry groups” (USDA FNS, *USDA foods*, 2010, p. 6). Total amounts spent with Section 32C funds can total up to \$126 million.

The USDA White Paper Program further explains changes to nutritional requirements over the past 30 years, as well as how food is processed (USDA FNS,

*USDA foods*, 2010). The USDA now offers low sodium chicken fajita strips and cheese sticks. There are also whole grain options for spaghetti, flour, rice, macaroni, pancakes and tortillas (USDA FNS, *USDA foods*, 2010, p. 12). Since the early 90's, meat options have diversified with lower fat options, even for beef patties. However, the "USDA encourages States to order more bulk items for processing into value added products to stretch the dollars spent on USDA Foods and meet individual school needs" (p. 12). For example, whole chicken is processed into pre-cooked breaded chicken patties and nuggets.

In order to encourage further processing, USDA has established National Processing Agreements with over 100 manufacturers to provide further processed products in 48 States. These Agreements relieve States and schools of much of the administrative burden associated with managing processing contracts. (USDA FNS, *USDA foods*, 2010, p. 14)

In order to continue processing of whole foods into pre-packaged and pre-cooked products without penalty in cost to school systems, manufacturers provide discounts and rebates to schools as well as distributor discounts, known as *value-pass-through systems* (USDA FNS, *USDA foods*, 2010, p. 14).

### **Changing and Improving the NSLP**

The 2010 NSLP reauthorization resulted in new discussion of the nutritional needs of children, especially in the school setting. First Lady Michelle Obama has made improving the health of children a priority by creating the Let's Move Initiative, which supports both nutrition and increased activity to eliminate the

childhood obesity epidemic. Public celebrities have also joined the battle against childhood obesity, including Jamie Oliver, who has created a reality television reality show devoted to changing the way that school cafeterias grow, purchase, and prepare foods in public schools. Many other organizations support an improved NSLP (See Table 2.1 for a non-inclusive list); however, most cannot agree as to how to implement nutritional and cost effective methods without making cuts in other key areas.

Samuels (2011) warns of possible resistance by special interest groups that traditionally support nutritional and wellness policies in the school setting, such as the American Association of School Administrators, the National School Boards Association, and the Council of the Great City Schools. These organizations have stated that they oppose parts of the Healthy, Hunger Free Kids Act of 2010 because new regulations require six additional cents be paid toward the per lunch reimbursement rate of \$2.72 and it pays for that change by cutting over \$2 billion from the food stamp program.

Provisions in the law require schools to raise the school lunch charge to the full reimbursement rate, which will be \$2.78 per lunch for those schools with fewer than 60% free/reduced rates. Even though this is the first increase in the per lunch reimbursement rate in over 30 years, many worry this will impose too great a restriction on school districts. Many school administrators worry that this will result in fewer lunch purchases; however, legislators are worried that those who can afford school lunches are being undercharged and the federal government is

covering the difference (Samuels, 2011). These additional financial concerns need to be addressed before more special interest groups fully support NSLP improvements.

Table 2.1  
*Organizations that Potentially Support NSLP Improvement*

<b>Organization Name</b>	<b>Web Address</b>
American Society for Nutrition	<a href="http://www.nutrition.org/">http://www.nutrition.org/</a>
Centers for Disease Control and Prevention (CDC)	<a href="http://www.cdc.gov/">http://www.cdc.gov/</a>
Food Research and Action Center	<a href="http://frac.org/">http://frac.org/</a>
Let's Move	<a href="http://www.letsmove.gov/">http://www.letsmove.gov/</a>
Physicians Committee for Responsible Medicine (PCRM)	<a href="http://pcrm.org/">http://pcrm.org/</a>
Revolution Foods	<a href="http://www.revfoods.com">http://www.revfoods.com</a>
Robert Wood Johnson Foundation	<a href="http://www.rwjf.org/">http://www.rwjf.org/</a>
School Nutrition Association	<a href="http://www.schoolnutrition.org/">http://www.schoolnutrition.org/</a>
Slow Food, U.S.A.	<a href="http://www.slowfoodusa.org/index.php/campaign/time_for_lunch">www.slowfoodusa.org/index.php/campaign/time for lunch</a>
Smarter Lunchrooms Initiative	<a href="http://www.smarterlunchrooms.org/">http://www.smarterlunchrooms.org/</a>
World Health Organization	<a href="http://www.who.int/en/">http://www.who.int/en/</a>

## **Opposition to an Improved NSLP**

Food manufacturing is a huge industry in the United States, and provided 1.5 million jobs in 2008 (U.S. Department of Labor, 2009). With this type of commitment of money and labor, incentives to change are rare and the NSLP program is no different. Eisler, Morrison, and DeBarros (2009) reported that “in the past three years, the government has provided the nation's schools with millions of pounds of beef and chicken that wouldn't meet the quality or safety standards of many fast-food restaurants” (para. 1). The ground beef at restaurants, such as McDonald's or Burger King, is tested “five to 10 times more often than the USDA tests beef made for schools during a typical production day” (para. 3). In addition, the rates of accepted bacteria levels accepted at fast-food chains are up to ten times more stringent than standards set by the USDA for meat prepared in schools (para. 4). In addition to less rigorous testing and standards for bacteria levels, meats donated to schools are not always cooked to the same standard. This substandard expectation allows for a market to be created for chickens that are no longer good for laying eggs, are rejected by Kentucky Fried Chicken, and would typically go to pet food or compost companies (Eisler, Morrison, & DeBarros, 2009). Thus, one might speculate that special interest groups, such as the American Meat Institute and Tyson Foods, are likely opposed to any increases in nutritional quality for school foods because it could result in reduced earnings for their companies.

The Palo Duro meat processing company might also contest any quality standards to meat sold in the NSLP since their company is the largest provider of

beef to schools. Many companies claim that quality controls result in increased cost and profit reduction, because it is cost prohibitive to test batches of meat every 15 minutes as do fast food meat processors for McDonald's and Burger King (Eisler, Morrison, & DeBarros, 2009). The Agricultural Marketing Service (AMS) is the USDA agency that buys and controls the quality of meat given to the NSLP. They only sample meat once every hour, and throw away thousands of pounds of meat only if bacteria is detected. Many scientists oppose this method because it has resulted in massive lawsuits, such as the one in 1993 when

...an outbreak of E. coli O157:H7 at Jack in the Box restaurants left hundreds sick and four children dead. Victims, most from the West, won more than \$50 million from the company and its suppliers. Reverberations from the event rippled across the fast-food industry. (Eisler, Morrison, & DeBarros, 2009)

As a result, fast food restaurants use much stricter standards for testing for pathogens, but processing companies for school food have not switched to this higher standard due to cost restrictions, and regularly oppose legislative changes that require improvement.

### **The Future of the NSLP**

At Little Village Academy, a Chicago public school, Principal Elsa Carmona has mandated all children buy lunch each day and no outside lunches are allowed without a doctor's note (Eng & Hood, 2011). Her reason for mandating school lunch purchases was that children were bringing unhealthy foods to school, such as soda and chips. There was no mention of school lunches being any healthier at Little

Village Academy, however, or if children are throwing away large portions of each meal. This push for increased school lunch sales aligns with the USDA goal of increasing the number of children each year who purchase school lunches, regardless of need. This appears to oppose an original intent of the NSLP, which was to provide nutritious meals to children who are not receiving them at home based on poverty.

In Danville, Illinois, Northeast Elementary Magnet School received a gold medal award from the Alliance for a Healthier Generation for its fight against childhood obesity (Associated Press, 2011). The cafeteria only serves low-fat or non-fat milk, serves fresh fruit and vegetables daily, and does not serve dessert. In addition, parents are not allowed to bring in sweets for any occasion, even birthday celebrations. Parents are required to sign contracts adhering to these food requirements, teachers must all wear pedometers, and children have Physical Education class every day. This is a school that requires an application for entry, and parents must volunteer at least 26 hours each school year; however, these requirements have not deterred parents from applying for positions for their children. In previous years, the school principal had to advertise to encourage enrollment, but now there are now twice as many applications as there are slots for children. More than 50% of students at this school receive free or reduced lunch; therefore, lunch offerings impact a large portion of the student body on a daily basis (Associated Press, 2011).



According to Gordon and Fox (2007), another current practice that many cafeterias engage in is the allowance of cafeterias to merely offer specific types of foods such as fruits and vegetables, but not requiring that those food items be served to children (p. 6). The NSLP was created to improve the health of children, and is touted as a national safety issue; however, school cafeterias claim that serving children healthy food would be too costly (Gordon & Fox, 2007). School administrators and cafeteria managers are also worried about raising the price of school lunches sold to the newly reimbursed rate of \$2.78 due to a potential decline in sales (Associated Press, 2011).

### **Schools and Obesity**

As discussed above, the NSLP is facing major obstacles to change by lobbyists, agribusiness, and processing companies. Because an overhaul of the NSLP is not a realistic objective at this point in time, nor is providing only the healthiest food options to all schools in the U.S. because of financial constraints, other measures must be considered that might aid in the reduction of childhood obesity. Supports with parents, schools, and cafeteria managers must be considered as potential methods. Another possible area of support might be the restructuring and regulation of competitive foods in the school setting. Detailed below are studies about childhood obesity, especially as related to the school setting, as well as what those in the international community are investigating as possible solutions and barriers to improved student nutrition and reduce childhood obesity.

## **Parent Understanding Of Childhood Obesity**

In an Australian study, Hesketh, Waters, Green, Salmon, & Williams (2005) investigated three primary schools in Victoria, Australia. They sampled students in grades two and five, held focus groups with 119 children, and interviewed 19 parents in late 2002. The researchers met in focus groups of 3-6 children, and used photos of food and activities as conversation starters. Most children were able to identify healthy food options and could identify physical activities that could keep them healthy; however, most children admitted to eating “unhealthy foods and frequently spent their unstructured time in sedentary pursuits” (p. 22). In addition, parents understood what good food and exercise activities were, but admitted that advertising and peer pressure were barriers to better choices. Hesketh et al., (2005) posit that the general perception of parents and students is that any food item offered at school is considered healthy, whether it is served during lunch or from a vending machine. This misconception then leads students toward not believing that traditionally unhealthy foods are “really that bad for you” (p. 24). Parents interviewed were found to expect that schools would take an active role in setting a good example for children, by setting appropriate policies and creating a healthy school environment. There was consensus that strategies should begin early, even before children begin school, and should focus on helping parents target obesity in children (Hawkins, & Law, 2006; Hesketh et al., 2005).

The Teen Eating and Activity Mentoring in Schools (TEAMS) Project in Washington State was assessed by Power, Bindler, Goetz, and Daratha (2010) to

determine whether students and parents believe that the nutrition education, physical activity programs, and school environment changes will actually reduce student obesity rates. Eight focus groups were held with seventh and eighth grade students from two middle schools in 2007, as well as 11 teachers and six parents. Parents and students shared that schools should offer healthier foods during lunch, as well as a variety of foods, in order to encourage healthy eating. Additionally, parents believed that schools should offer students an opportunity to participate in more non-competitive sports activities.

Only two percent of school-aged children in the U.S. consume the recommended number of servings each day from all five major food groups, and less than 20% eat five servings of fruits or vegetables a day according to a report compiled by Action for Healthy Kids (2004), an organization that was founded and chaired by David Satcher, previous U.S. Surgeon General. Action for Healthy Kids attempts to support schools by facilitating healthy school options for undernourished children and obesity prevention by supporting schools and nutrition and physical education. Their detailed literature review reflected concern that the number of children consuming soft drinks increased by 41% between 1970 and 1994. It is estimated that between 60 and 80% of children over age five drink soda on any given day, and more than a third of children age 11-18 consume “more than three servings of soda a day” (p. 9). On top of a diminished nutritional diet, many school-aged children also live sedentary lifestyles, which include watching television, and playing video games (Action for Healthy Kids, 2004). These

nutritional and physical health deficiencies are the reality for many children, and most parents are unclear about how to help their children maintain a healthy weight (Hesketh et al., 2005).

Varni, Limbers, and Burwinkle (2007) analyzed data from the PedsQL 4.0 Generic Core Scales in order to assess chronic conditions ailing 2,500 children aged 5 to 18 between years 2000 and 2006. Interviewers completed surveys either in person or over the telephone and assisted children ages 5-7 as needed; whereas, older children completed the forms independently or with their parents. Parents of severely obese children reported significantly lower emotional health and functioning in their children. An additional area of concern noted by parents about their severely obese children was the self-report of poorer school performance, especially in comparison to those children who were classified as obese or overweight.

Varni, Limbers, and Burwinkle (2007) determined that some parents demonstrate concern and worry about their overweight, obese, and severely obese children; however, Lampard, Byrne, Zubrick, and Davis (2008) found that some parents of obese children do not express degrees of concern about their child's weight, and/or underestimate the weight of their children. Lampard et al., (2008) used data from the Childhood Growth and Development Study (GAD) in Australia. They analyzed data of 6 to 13 year old children between years 2004 and 2006. Three hundred forty-seven children who met the criteria for overweight or obesity were interviewed, as well as 276 parents. Lampard et al. (2008) found that "48%

and 34% of parents of overweight children reported no concern and little concern, respectively, for their children's weight... [and] 5% and 13% of parents of obese children reported no concern and little concern, respectively" (p. 87). Of additional concern was the misperception by parents about their child's actual weight. "Fifty-one percent of parents of obese children and 44% of parents of overweight children underestimated their child's weight status" (p. 87).

### **Body Mass Index (BMI) Measurements**

One strategy that many schools are considering is the measurement of each child's BMI score. Meriaux, Hellstrom, & Marild (2008) identified and followed up on obese ten-year-old children in Sweden. They found that identifying obese children in school could help decrease their BMI over time. It appeared that the simple act of pointing out the numbers to children and parents could be one method of helping address the obesity epidemic. Gibbs et al. (2008) caution that as schools consider mandating school based BMI measurement programs, they should receive training to protect each child's body image perception since they have the potential to trigger "body image dissatisfaction and related problems, such as poor self-esteem, unhealthy eating behaviours [*sic*] and reduced physical activity" (p. 56).

Li and Hooker (2010) investigated the relationship between school, families and childhood obesity by using data from the National Survey of Children's Health (NSCH) compiled by the CDC. They completed a nonlinear regression of survey data from 62,880 children aged 6-17. Li and Hooker (2010) determined that children with lower BMI scores were more likely to participate in sports, watch less

television, and have parents who were more physically active with higher education levels. In addition, children who were certified for the National School Lunch Program (NSLP) had “a 4.5% higher probability of being overweight compared to children not eligible” (p. 101), indicating a statistically significant correlation between lower socioeconomic status and the likelihood of obesity. Moreover, children who reported attending “public schools have higher BMI values than those attending private schools” (p. 99).

### **International Perspectives About Childhood Obesity**

Countries that have typically had lower rates of obesity and overweight in children and adults are now seeing increases. Switzerland is beginning to create and implement obesity prevention strategies to address the 17-19% of students who are now overweight (Bucha Della Torre, Akre, & Suris, 2010). Many Swiss schools already have partial initiatives to prevent obesity, such as healthy meals offered in the cafeteria, no vending machines, and targeted activities to keep children healthy. Bucha Della Torre, Akre, and Suris (2010) investigated the opinions of “different school stakeholders about the feasibility and acceptability of current obesity prevention studies that could be implemented in Swiss schools” (p. 234). They held focus groups with 40 different school stakeholders: school directors, Physical Education teachers, catering staff, school nurses, parents, and children ages 10-11. Swiss teachers and parents cited the availability of competitive foods, both in and outside the cafeteria, as major obstacles for reducing overweight and obesity in children. Unhealthy food options in vending machines, as well as

food high in fat served in the school cafeteria are too easily accessed by school children. Another barrier to improved student nutrition was the increased cost of healthier food options. Finally, stakeholders emphasized the importance of complete political support, “at all governmental levels (city council, canton, etc.) ... as an important issue for the implementation and acceptability of obesity prevention programs” (Bucha Della Torre, Akre, & Suris, 2010, p. 237).

Researchers in Israel completed a long-term study to reduce childhood obesity to determine whether targeting children only or parents only would reduce obesity rates (Golan & Crow, 2004). Seven-year-old children were randomly assigned to both groups, children attended 30 one-hour sessions and parents attended 14 one-hour sessions. The children were weighed and height measured at one, two, and seven years after the intervention. After the parent only intervention, 35% of children “reached a non-obese status” (p. 359), but children-only intervention resulted in only 14% reaching a non-obese weight. Golan and Crow (2004) speculate that involving the entire family in weight loss and nutrition education is necessary to facilitate long-term change.

Food portion offerings have been increasing worldwide and Lioret, Volatier, Lafay, Touvier, and Maire (2009) wanted to assess how that impacts children in French schools because few studies have investigated portion size as related to children’s weight. Their “study used data from the French INCA1 (Enquête Individuelle et Nationale sur les Consommations Alimentaires) food consumption survey to describe dietary intake in each food category in French children aged 3–11

years” (p. 383). The data were divided into two age groups, children ages three to six and those ages seven to eleven. Findings from 719 children, who completely filled out the surveys with their parents, were compiled using age and sex adjusted logistic regression models. Their results reflect increased serving size consumption by children aged three to six, especially items with more sugar, such as sweet pastries and biscuits (p. 385). Furthermore, children who were overweight in the older age group consumed less milk. Lioret et al. (2009) noted that many of the food items that overweight children consumed were “convenience foods’, which are often packaged for single-serving consumption” (p. 386). Additionally, they speculated that increased serving sizes of unhealthy food items were decreasing serving sizes of healthier options.

Pagliarini, Gabbiadini, and Ratti (2005) investigated food choices in Italy with 120 children, between ages seven and ten in spring 2002. Students completed scaled surveys rating meal combinations to assess student preferences of various food combinations. Findings indicate that older children (10 years old) were more discriminatory with their food selections. The seven-year-old children appeared to like more food choices, as indicated by their significantly higher rating scores, including vegetables. Pagliarini, Gabbiadini, and Ratti (2005) speculated that younger children were more open to a variety of foods, and as children age they become more selective; therefore, the opportunity to introduce healthier food diminishes as children grow older.



Swinburn, Sacks, Hall, McPherson, Finegood, Moodie, and Gortmaker (2011) wrote a policy analysis about possible causes of the increasing worldwide obesity epidemic and share that “all countries are searching for answers about how to reverse the rising tide of adult and childhood obesity” (p. 804). Swinburn et al. (2011) detailed reasons why the major culprit of increased obesity is the current “food system: the increased supply of cheap, palatable, energy-dense foods” (p. 807), especially for those people living in poverty stricken countries. Methods of counteracting this obesogenic system require new interventions and policies, especially agricultural policies that create positive “health outcomes” (p. 810). However, Swinburn et al. (2011) predict that the ability of a government to reverse the current policies in place will be easier for “programme-based [sic] and education-based interventions” (p. 810) because the power of the food lobbyists at the central government level is too large to change current food policies.

### **School Food Offerings and Obesity**

Speculation about the quality of school food in the US, and whether it contributes to the childhood obesity epidemic has become a recent topic of intense scrutiny. Schanzenbach (2008) assessed the NSLP by extracting data from the Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K) beginning in 1998-99 through 2007-08. Children’s height and weight was measured at the beginning and end of Kindergarten, first, third, and fifth grades. Children’s BMI was calculated from those measurements, thus determining whether children were underweight, within normal range, overweight, or obese. Additionally, parent survey data about

whether children participate in the school lunch program was counted if the term “usually” (p. 687) was checked. In order to isolate possible differences between those children who brown bag their lunch, and those children who purchase lunch, Schanzenbach (2008) used this longitudinal data of the Kindergarten cohort to capture “differences in obesity by the time a student starts school” (p. 689). Based on this national sample, children “who eat school lunch gain more weight after starting school than students who brown bag their lunch” (Schanzenbach, 2008, p. 707) and consume more calories. Moreover, students from low-income families have double the obesity rate by fifth grade as compared to first grade (p. 700).

Millimet, Tchernis, and Husain (2009) expanded upon Schanzenbach’s 2008 study by analyzing the ECLS-K data to assess children’s health in first grade and again in third grade. The sample included 13,531 children and health was determined by determining BMI, growth rate, change in BMI percentile, and overweight/obese indicators. The data suggest that children who participate in the NSLP gained 3.1% more weight by the time they reached third grade, and had “a 6.8% increase in the probability of being obese in third grade” (p. 646).

Finkelstein, Hill and Whitaker (2008) evaluated U.S. public school food environments and policies (SFEP’s) at the elementary, middle, and high school level by analyzing data from a sample of 395 U.S. public schools and 129 school districts in 38 states. They found that elementary schools typically have “healthier food environments and policies” (p. e256) than do middle and high schools; however, less than half of elementary schools offered fresh fruit or vegetables on a daily basis.

At all grade levels, more than three-quarters of schools offered french fries and desserts for sale, and 80% of schools had meal choices with more than 30% of calories from fat (p. e255).

Bevans, Sanchez, Tenneralli, and Forrest (2011) conducted an observational study in order to assess whether the offering of healthy foods to students during lunch would result in healthier eating habits. Their results indicate that when schools “made nutritious foods available during lunch periods... [it was] associated with improved eating behavior among students” (p. 427). The one factor that negatively impacted student eating habits was the ability to purchase a la carte items. If more a la carte items, such as chips, cookies, or ice cream, were purchased by students, then eating behaviors were found to be less healthy. Bevans et al. (2011) concluded that if schools offered healthier food options and reduced a la carte availability, then students would have more balanced eating habits.

Turner and Chaloupka (2012) sent a national survey to 2647 public and 1205 private elementary schools that participate in the NSLP. They analyzed data between the 2006-07 and 2009-10 school years and attempted to determine what types of extra foods have been available to elementary school students in various regions of the United States over time. Their findings revealed that competitive food that competes with the school lunch program was available in the southern states at significantly higher rates than in other regions. In addition, schools in the south reported having items that were higher in sodium, sugar, and were labeled low-fat than did elementary schools in the western states and in the mid-west (p. 168).

**Children's nutrition and obesity.** Braet (2006) completed a study of 110 obese children ages 7 to 17 who participated in a 10-month obesity treatment program and the two year follow up. Children completed the Self-Perception Profile for Children (SPPC), the Child Behavior Checklist (CBCL), the Eating Disorder Examination (EDE), and had their height and weight checked in order to assess BMI status. Findings regarding age reveal that children who were 12 years old, or older, lost and kept off more weight than children who were younger than 12 (Braet, 2006). Braet (2006) speculated that older children might have more self-control and discipline than younger children, and that younger children will require interventions involving adults, such as their parents, to help them lose and maintain a healthy weight.

Davis, Gance-Cleveland, Hassink, Johnson, Paradis, and Resnicow (2007) completed a literature review in order to help guide physicians and clinicians with specific approaches and evidence-based ideas to help prevent childhood obesity. In addition, they addressed possible policy initiatives that might also prevent childhood obesity. Obese children tend to have higher fat intake, lower calcium intake, increased sweetened drink consumption, and are more likely to skip breakfast (Davis et al., 2007). Of particular concern was increased consumption at fast food restaurants and increased portion sizes. In fact, Davis et al. (2007) reported that increased portion size could be a contributing factor in obesity and overweight in children, as demonstrated by reports that "three to 5 year old children consumed 25% more of an entrée and 15% more energy at lunch when

presented with portions that were twice as large as the age-appropriate standard size... [and] the most powerful determinant of the amount of food consumed at meals was the amount served” (p. S232). In the school setting, emphasis has been on increased participation, but purchasing more school foods has “less consistently demonstrated changes in body weight” (S243). School-based prevention strategies should consist of a three-pronged approach that promotes healthy foods, discourages less-healthy foods in the cafeteria and vending machines, and increases health education opportunities (S243).

### **Healthy Lunch Barriers**

Lambert and Carr (2006) surveyed teachers, administrators and food service directors in Idaho and Arkansas about the feasibility of providing nutritional education to elementary students in order to improve food choices and student health. The biggest obstacle cited was the lack of funding, as well as time to instruct students during lunch, or any other time during the day, based on increased academic rigor. An additional obstacle to providing nutritional education was lack of appropriate training for cafeteria staff. The final barrier facing school personnel was the lack of parental involvement with regard to what components make up a nutritious meal.

In Norway, researchers investigated barriers to healthy meal implementation in the school setting (Holthe, Larsen, & Samdal, 2011). New nutritional guidelines had been recommended to schools in 2005, but not required, reflecting increased availability of water, fruits, vegetables, and low fat options. Food items that were

specifically discouraged from being sold in school cafeterias were “fizzy drinks, diluted juices, sweets, cakes, and buns” (p. 316). Holthe, Larsen, and Samdal (2011) completed a multiple case design with an exploratory approach. They selected three secondary schools from a sample of schools that had received a grant to encourage the implementation of the new nutritional recommendations. Each school had 300-500 students, with lunch breaks lasting 30-45 minutes. Principals and project managers were interviewed separately, and students and teachers participated in separate focus groups. Their analysis of the interview and focus group data revealed four key barriers that effected the implementation of the new guidelines: difficulty of students accepting the changes, lack of resources and funding, conflicting values and goals, and access to outside food options during the school day. Holthe, Larsen, and Samdal (2011) detail the differences in perceptions between the students and teachers. Principals and teachers were more concerned about implementation and cafeteria staffing; whereas students had more self-centered concerns regarding food quality and access.

Cho and Nadow (2004) interviewed superintendents, principals, food service directors, and school nurses to determine what barriers exist to providing a quality lunch and nutrition education. Their results indicate that funding was the largest obstacle to serving a healthy lunch. Additional concerns were the large number of vending machines available in the school setting, but administrators cite budget deficits as reasons why they competitive foods must remain in schools. Other barriers detailed by respondents were students’ food preferences, lack of parent

support, and poor communication between health care workers, food service personnel, and school teachers. Cho and Nadow (2004) indicate that if funding were to increase, then more fresh fruits and vegetables would be served to students and fewer vending machines would be available for students to purchase unhealthy food.

**Competitive foods in the school setting.** The School Health Policies and Practices Study (SHPPS) is a national survey conducted every six years in order to assess school health policies (National Center for Chronic Disease Prevention and Health Promotion, 2008). According to the latest SHPPS, 21% of elementary schools, 62% of middle schools, and 86% of high schools had one or more vending machines available for student use. Each state has its own regulations, but most align with current USDA policy about the sale of foods that compete with the school meal program (US Department of Agriculture, Food and Nutrition, 2002, September). Those policies require that vending machines be unavailable during lunch periods, but 11.9% of elementary schools, 25.4% of middle schools, and 48.0% of high schools allowed students to purchase unhealthy foods and beverages from a vending machine, or school store, during that time frame (National Center for Chronic Disease Prevention and Health Promotion, 2008). This inconsistent implementation could be a factor contributing to the childhood obesity epidemic.

French, Jeffery, Story, Hannan, & Snyder (1997) attempted to reduce the price of healthy food items sold in college vending machines in order to determine whether that would increase sales. They chose nine vending machines at a

Minnesota college campus to place low fat food options with varying prices. The within-machine design over three different time periods indicate that merely lowering the price of healthy snacks can significantly increase the sales volume of those items. Additionally, during that same time period fewer unhealthy items were sold. In a later study, French, Jeffery, Story, Breitlow, Baxter, Hannan, and Snyder (2001) investigated lower sale prices of healthier food options in vending machines in 12 secondary schools, as well as at 12 adult work locations in Minnesota over 12 months. They lowered prices by 10%, 25%, and 50% on low-fat items to determine whether sales would drop, stay the same, or increase. Their findings indicate that price reductions of 25-50% resulted in the most significant increases in healthy food purchases, “machine profits were not significantly affected,” and there were no significant differences in sales between adolescent and adult vending machine locations (p. 115). Therefore, on the basis of this study, it appears that offering and controlling the prices of healthy food choices in secondary schools could result in healthier food choices being made by high school students.

Gemmill and Cotugna (2005) investigated the quality of foods served in Delaware school vending machines. They sent out a 20 item survey to the Nutrition Supervisor in each of the 19 school districts, and had a 52.6% response rate. Their results indicate that most foods sold in vending machines have minimal nutritional value. More importantly, they discovered that almost half of schools in Delaware have contracts with specific soda companies (PepsiCo, or Coca Cola), and school principals are the personnel who negotiate the contracts. The money earned



through vending machine sales is used by the schools for extracurricular activities, school activities, and building maintenance (Gemmill & Cotugna, 2005). Ten percent of schools earn between \$50,000 and \$100,000 per year, and another ten percent earn over \$100,000 per year with their vending machine contract (p. 97).

Therefore, Gemmill and Cotugna (2005) speculate that schools negotiate contracts in order to make money that will benefit their school, rather than focus on nutritional policies set by the USDA. Unfortunately, the reality is that unhealthy foods sold in schools are contributing to the decline in health and the increase in obesity for U.S. school children (Larson & Story, 2010).

French, Story, Fulkerson, and Gerlach (2003) completed a two year, group randomized nutrition intervention study in 20 high schools in Minnesota, assessing a la carte and vending machine sales. The intent was to assess district policies and determine food offerings that influenced the food environment. They defined a la carte items as any food for sale in the cafeteria that was not federally reimbursable; however, the definition did not include second servings of lunch items for sale. Vending machine locations were collected, and food item offerings analyzed for nutritional content. Their findings reflect unhealthy choices made by high school students when purchasing additional food items: 21.5% of sales were chips or ice cream/cookies; whereas, only 4.5% of sales were of fruits or vegetables (French et al., 2003).

In 2005, the U.S. Government Accounting Office (GAO) compiled a report in order to provide the U.S. Senate Committee on Agriculture, Nutrition, and Forestry

an understanding about the degree to which competitive foods were sold in schools. The GAO (2005) created and sent out two surveys, between October 2004 and February 2005, to randomly selected schools representing the more than 80,000 schools that participate in the NSLP. School administrators and School Food Authority (SFA) representatives were asked to complete the different surveys about the sales of competitive foods in the school setting. In addition, site visits to six school districts were completed in California, Connecticut, Mississippi, Missouri, and South Carolina. Findings from this study reveal that more than 90% of schools sell competitive foods through a la carte, vending machines, and school stores. Furthermore, the GAO (2005) determined that competitive food availability and sales volume has increased significantly between 1998 and 2005 (p. 20). In fact, “food services generated a greater amount of revenue through a la carte sales than through any other type of competitive food sales” (p. 29). The GAO (2005) estimated a la carte sales generated more than \$50,000 in 40% of high schools, and generated more than \$125,000 in 20% of high schools (p. 29). Thus, the GAO (2005) reported that a major barrier to any changes made to competitive food sales was tied to concern by administrators over losing significant amounts of money.

Delva, O’Malley, and Johnston (2007) assessed data from two studies conducted at the University of Michigan: Monitoring the Future (MTF) and Youth, Education, and Society (YES). Nationally representative samples of students in grades eight, ten and twelve were randomly selected to complete MTF surveys in approximately 410 schools over a two year cycle. YES consisted of administrator

questionnaires that asked about school policies, including those related to food services. Delva, O'Malley, and Johnston (2007) found offerings of "a la carte items [differed] significantly between grade levels" (p. S229). High school students have more access to healthy food items in vending machines, student stores, or snack bars than do middle school students. Unfortunately, high school students also have significantly higher numbers of unhealthy food items available to them than middle school students. Of additional concern was the racial disparity between Hispanic high school students and white and black students (Delva, O'Malley, & Johnston, 2007). Hispanic students attend high schools that serve brand-name fast food items on the a la carte menu twice as often as white and black students (p. S233).

Park, Sappenfield, Huang, Sherry, and Bensyl (2010) completed a cross-sectional study in 2003, administering the Youth Physical Activity and Nutrition Survey (YPANS) to 4,452 students in grades six through eight in Florida. They were interested in assessing student access to unhealthy food choices, and also wanted to investigate whether race, age, or weight had an impact on the types of food choices that children were making in the school environment. The response rate for the YPANS was 72%, with even distribution between males and females, 22% of students were overweight or obese, 50% were white, 25% were black, and 21% were Hispanic. Survey responses reflect significant numbers of meal substitutions, with 28% of students buying a snack or drink from a vending machine instead of a school lunch within the five days prior to survey administration. The most common foods purchased by students were "less-healthy ... [and] only 1.7% of children

purchased 100% fruit juice, and 5.6% of children purchased low-fat milk” (Park et al., 2010, p. 1536). Risk factor analyses indicated that schools with vending machines had students who were 3.5 times more likely to replace their school lunch with purchases from a vending machine. In addition, black students and those students who smoked were at a higher risk for replacing their lunch meal with a vending machine purchase (Park et al., 2010).

In order to assess only those items sold in the school environment with little regulatory control, Kakarala, Keast, and Hoerr (2010) investigated competitive food and beverage purchases that did not include a la carte items sold by school cafeterias. The data set they used was of 2,309 students from the SDNA-III data set by Gordon et al. (2007a), as described above. Kakarala, Keast, and Hoerr (2010) analyzed food intake by age/grade, gender, ethnicity, and free or reduced lunch status using the statistical software SUDAAN. Competitive foods and beverages were consumed by approximately 22.1% of students. In addition, the percentage of students purchasing competitive foods or drinks was not significantly lower for those students who receive free or reduced meals (p. 431). The only ethnic difference was at the elementary level in grades one through five, where fewer Hispanic children purchased competitive items in comparison to white students.

A la carte offerings have been touted as discriminatory because they are often not accessible to low income students (Bhatia, Jones, & Reicker, 2011). In 2008, Bhatia, Jones, and Reicker (2011) completed a pilot intervention assessing changes in the NSLP in three secondary schools in San Francisco, CA. The major

changes made to the NSLP were an increase in meal offering choices, as well as eliminating all a la carte offerings outside of the NSLP program. Bhatia, Jones, and Reicker (2011) collected average daily “participation in the meal program disaggregated by the student’s NSLP subsidy status” (p. 1381). Findings reveal that increasing food variety and eliminating competitive foods outside of the NSLP program resulted in increased lunch sales by up to 73% for students qualifying for free lunch, and up to 154% for those students who qualified for reduced lunch prices (p. 1382). Bhatia, Jones, and Reicker (2011) advocate removing competitive foods from NSLP meals in order to reduce discriminatory identification of those students who qualify for subsidized meals, as well as to increase NSLP meal participation.

Cullen, Eagan, Baranowski, Ownes, and de Moor (2000) completed a cross sectional study of 604 fourth and fifth grade student in Texas to assess whether access to snack bars impacted fruit and vegetable consumption. Students completed fruit and vegetable preference questionnaires, and five days of lunch food records were collected. Their findings indicated that children in fourth grade consumed significantly more fruits and vegetables than fifth grade students. Also, fifth grade students with access to snack bars consumed significantly fewer servings of fruits, vegetables, and juices. Furthermore, those students without access to snack bars consumed more fruits, vegetables, and juices. In 2004, Cullen and Zakeri again investigated the connection to snack bar access and fruit and vegetable consumption by assessing cross sectional data from 594 fourth through sixth grade

students in Texas. Students completed lunch food records four times over a two year time span. Their findings confirmed the prior study that middle school students with access to competitive food snack bars eat fewer fruits, vegetables, and juices. Furthermore, students with access to snack bars consumed more sweetened drinks and high fat vegetable servings compared to students without snack bar access during the school day.

Kubik, Lytle, Hannan, Perry, and Story (2003) completed a cross-sectional study of seventh grade students from sixteen middle schools in St. Paul, Minnesota. They assessed the number of vending machines and fried potato servings and compared student consumption of fruits and vegetables based on 598 24-hour recall surveys and 645 interviews. In the schools selected, Kubik et al. (2003) found that students who attended schools without a la carte programs consumed significantly more fruits and vegetables per day than students from schools that did sell a la carte items. In addition, students that attended schools that sold a la carte items consumed significantly more total and saturated fat.

Vericker (2011) completed a dissertation study through George Washington University investigating whether competitive foods impacted fruit and vegetable consumption. By analyzing data of fifth and eighth grade students from the Early Childhood Longitudinal Study 1998-99, Vericker estimated changes in fruit and vegetable consumption based on access to competitive food purchases in children based on race, SES status, and gender. However, there were no significant

differences in fruit and vegetable consumption between children with access to competitive foods and those without access to competitive foods.

**Second servings.** Martin et al. (2007) completed a pilot study of 53 children in sixth grade. The purpose of this study was to test the implementation of digital photography to measure food intake at school. Photos were taken before and after of each student's lunch tray for five consecutive days. Additionally, the students completed questionnaires measuring depression and self-esteem. Findings revealed that boys consumed more food than girls. The majority (52.9%) of second servings selected by students were starches, next were "condiments (17.6%), entrees (14.7%), vegetables (7.4%), and fruit (4.4%)" rounding out the other second serving selections (p. 154). On days when second servings were available children placed significantly more food on their trays; however, "mean food intake did not differ as a function of the availability of second servings (Martin et al., 2007, p. 153). Those children who returned for second servings more than one day out of the five were noted to eat, on average, 190 kilocalories more than children who never chose second servings (p. 154). Martin et al. (2007) also noted that students who selected second servings tended to have higher BMI scores and ate more food on days when second servings were not allowed than children who never selected second servings.

### **Economic Burden of Obesity to Society**

Wang, McPherson, Marsh, Gortmaker, & Brown (2011) completed an economic analysis about the potential financial burden that obesity will create in the

United States (U.S.) and the United Kingdom (U.K.). They analyzed “the National Health and Nutrition Examination Survey (NHANES) from the USA and the Healthy Survey for England (HSE)” (p. 817). From those surveys, they were able to extract BMI trends, and create obesity projections for each country for the next 20 years. Their results indicate that obesity rates in the US could rise from 32% in 2007 to 50% by 2030, resulting in up to 65 million more obese people. In the UK, their obesity rates could rise from 26% to more than 40%, resulting in up to 11 million more obese people (p. 817). The medical costs incurred by obesity related diseases, as well as loss of work years is expected to be substantial (Wang et al. 2011).

Another economic burden, predicted by Wang et al., will be the increased cases of *presenteeism*, whereby an obese person attends work but is less productive during the workday. The projections, per obese employee, of lost revenue are almost \$3800.00 per year, or “the equivalent of 1 [sic] month of lost productivity” (p. 817). Wang et al. (2011) also assessed the increased burden facing the health care profession based on historic trends, and projections include “an excess of 8 million cases of diabetes, 6-8 million cases of coronary heart disease and stroke, and over 0.5 million cases of cancer” in the U.S. alone (p. 817). These trends indicate that work productivity will fall, healthcare costs will increase exponentially, and tax payers will ultimately bear the burden of these costs. Therefore, Wang et al. (2011) suggest that if the U.S. and U.K. make an effort to reduce the BMI of its citizens by only 1%, then the health benefit would be substantial in the U.S. with 2.1-2.4 million



fewer cases of diabetes 1.4-1.7 million fewer cases of cardiovascular disease, and 73,000-127,000 fewer cases of cancer.

Poor nutrition, inactivity, and weight problems can indirectly drive up a school's operating costs (Action for Healthy Kids, 2004). Schools are responsible for helping students whose academic performance and/or behavior suffer because of health problems related to obesity; and children who are obese miss, on average, one day of school per month (Action for Healthy Kids, 2004). Additionally, severely obese children can miss up to four times as many days of school as children are of healthy weight (Schwimmer, Burwinkle, and Varni (2003). "Chronically undernourished children attain lower scores on standardized achievement tests, are more irritable, have difficulty concentrating, and have lower energy levels" (p. 14). Another financial burden results from schools' responsibility of staffing their office with qualified healthcare personnel to administer the many medications children need due to reduced nutrition, lack of exercise, and obesity (Action for Healthy Kids, 2004).

The data above suggest a relationship between economic status and childhood obesity, and public schools are more at risk for serving obese and overweight children than the private sector. Public schools must be provided the resources and support to help address the nutritional and health inequities between the public and private setting. Given the cuts in Physical Education programs and time allotted to exercise during the school day due to the increased focus on academics, schools have few options available to help reduce childhood obesity.

Therefore, improving the nutritional quality of all foods sold through the NSLP in cafeterias and vending machines, as well as limiting the total calories that children can purchase each day, could be an option for public schools in combating the childhood obesity epidemic.

### **Limitations of the Literature and Future Research**

Very few studies have been conducted that target second servings and a la carte food item sales associated with the NSLP as they relate to childhood obesity. Of special concern is the increase in calories that children are consuming when they purchase extra food items, and the potential decline in healthier food choices; however, there is scarce literature available to reflect this needed area of study. Using Proquest Research Library, searching all databases within the service, yielded zero results about the school lunch program or childhood obesity for the search term 'second servings'. Additional search terms were 'second serving', 'second servings' and 'school lunch', 'second servings' and 'a la carte', and 'second servings' and 'school'. The search term, 'second serving', when entered in Proquest Research Library, yielded 79 results; however, none of them were related to serving sizes of school meals or amounts of food served to children in the school setting. When searching Dissertation and Theses: Full Text, using the same search terms as above, results were similar. Dissertations have been published recently that do reflect continued interest in competitive food sales as they impact fruit and vegetable purchases (Vericker, 2011); however, the data collection was based on student recall. Recent studies also reflect a growing interest in the types and frequency of

foods served at classroom parties, especially those in low-income schools (Isoldi, 2010). There were no dissertations or theses papers that reflected measurements of a la carte or main entrée second serving purchases made by students of varying grade levels. Prior studies have focused on students in specific grade levels, but did not look at elementary school purchase data as defined by individual grade levels.

Many studies have investigated childhood obesity rates, genetic links to obesity, as well as parental support projects (Golan & Crow, 2004; Li & Hooker, 2010; Hawkins, & Law, 2006; Hesketh et al., 2005; Robinson & Sirard, 2004). James, Thomas, Cavan and Kerr (2004) assessed educational programs in England that attempted to reduce childhood obesity by addressing the consumption of sugary carbonated drinks by children aged 7-11. A few studies have been conducted regarding economic incentives that might influence school lunch purchases; however, most addressed reducing the cost of food items in order to increase sales of such items as fruits and vegetables (Bere, Veierød, Bjelland, & Klepp, 2006), and decreasing sales of high-fat vending machine items and energy-dense snacks (Epstein et al., 2006; French et al., 2001).

There is much debate about the nutritional quality of school lunches, and whether schools can afford to offer healthier foods on a regular basis; however, very few studies have investigated the sale of second servings and/or a la carte purchases made by students and its possible relationship to childhood obesity based on increased caloric intake. Determining the types of foods that children are purchasing as an extra, as well as what they choose to buy seconds of is an

important factor to consider when contemplating policy change. Therefore, this study fills that void in the literature by assessing the rates and choices of second serving and a la carte purchases made by elementary students in one school district. Furthermore, I investigated the perceptions of cafeteria managers regarding their responsibilities about second serving and a la carte sales as a component of the NSLP, as well as attempt to assess the economic implications of additional food item sales.

## **CHAPTER 3**

### **METHODS**

In this chapter, I review the research questions for this study and the mixed method design to answer them. This is followed by a review of my perspective on this work and how it was informed by my professional background. Descriptions of the participants and setting for this study and how data were collected is followed by details of how these data were analyzed.

#### **Rationale**

There is much debate and research about the nutritional quality of school lunches, and whether schools can afford to offer healthier foods on a regular basis; however, very few studies have investigated the sale of second servings and/or a la carte purchases made by students and its possible relationship to childhood obesity. Therefore, this study proposes to investigate the percentage of elementary students in one school district who purchase second servings and/or a la carte items, in addition to a purchased school lunch, with data disaggregated based on age and demographics.

#### **Research Questions**

Because childhood obesity is now considered an epidemic, one that the United States government is attempting to rectify within one generation, it

necessitates a consolidated effort on the part of parents, schools, and localities to impact the needed legislative changes, policies, and reform. Knowing that children do not have enough Physical Education on a regular basis, do not eat enough fruits and vegetables, and that many parents lack knowledge about what constitutes healthy weight for their children, schools and cities in the U.S. are considering possible changes in school and cafeteria policies. Childhood obesity is a pervasive, worldwide problem with implications for school cafeterias to bear some of the responsibility for providing healthy meals and appropriate portion sizes to children; therefore, I studied the following:

1. Are elementary students purchasing second servings of main entrées and/or a la carte food items during lunch? If so, how often?
2. What extra food items are children in elementary schools purchasing in school cafeterias?
3. Are second serving main entrées and/or a la carte items purchased at different rates based on grade level?
  - a.  $H_{01}: \mu_1 = \mu_2$ ; Second serving purchases are not affected by student grade level.
  - b.  $H_A: \mu_1 \neq \mu_2$ ; Second serving purchases are affected by student grade level.
4. How are cafeteria managers in the elementary schools of the selected school district implementing second serving and a la carte sales in the school setting?

## **Research Design**

To further understand the feasibility and role of potential changes in the school lunch program, as well as see the bigger picture about how additional food sales occur in elementary cafeterias, a mixed methods single-case design was used to study an elementary school lunch program housed in a school district in the mid-Atlantic region of the United States (Yin, 2009). Case studies are considered the “preferred method when (a) ‘how’ or ‘why’ questions are bring posed, (b) the investigator has little control over events, and (c) the focus is on a contemporary phenomenon within a real-life context” (Yin, 2009, loc. 313). A case study is the ideal methodology for this research based on the need to know how elementary school children are purchasing second servings and/or a la carte items.

When designing a case study, Yin (2009) advocates, “defining the unit of analysis (or the case itself)” (loc. 1303-1304). The case, in this study, was the second serving and a la carte purchasing habits of elementary school students in one medium sized school district in the mid-Atlantic region, as assessed through frequency and factor analysis as well as staff interviews. Yin (2009) advocates single-case study design as a method of representing “a significant contribution to knowledge and theory building... [and] can even help to refocus future investigations in an entire field” (loc. 206-1207). Because so little is known about the additional serving and a la carte purchases made by elementary school-age children, this case study will, hopefully, offer significantly to the literature.

Quantitative research allows one to extend or create a theory based on “explanation, understanding, prediction, and control” (Dimitrov, 2008, p. 37). The empirical method of systematically testing hypotheses results in studies that are replicable, and leave subjective feelings of the researcher out of the equation. Dimitrov (2008) defines the six major steps of quantitative research as follows: 1) identify the problem, 2) define the purpose of the study, 3) share the research question and hypothesis, 4) describe the research design, 5) share the data analysis, and 6) interpret the results and generalize (p. 37). Following these steps with integrity allows researchers to increase their ability to generalize findings across settings.

Qualitative research, on the other hand, can be more interactive and flexible than quantitative research (Maxwell, 2005). If components of the study change, the research design is intended to change in response to the needs of the study. Maxwell (2005) outlines the five components of a qualitative study as follows: 1) define the study goals, 2) create a conceptual framework to guide or inform the study, 3) create the research questions, 4) define the methodology, and 5) focus on validity issues (p. 4). Following these steps, and maintaining study flexibility, allows researchers to better understand the studied process in a real-life setting.

A mixed methodology was chosen as the data collection procedure for this case study because “mixed methods research can permit investigators to address more complicated research questions and collect a richer and stronger array of evidence than can be accomplished by any single method alone” (Yin, 2009, loc.



1506). Having an opportunity to look at the quantitative data that represents the degree to which students are purchasing extra food items each day in the school cafeteria is information will inform the public, as well as policymakers, about what and how often those sales occur. However, having only that information was not nearly as persuasive as adding the qualitative interview data that indicated *how* cafeteria managers are implementing extra food item sales and managing the school cafeteria budgetary requirements. It was helpful to learn whether extra food items were being promoted in any way by cafeteria staff, or if certain foods are placed closer to children's reach in order to facilitate purchasing, and whether budget requirements impact how staff make a la carte purchases from vendors. These interviews were considered an essential component of this study in order to explore perspectives, experiences, and understanding about potential economic implications regarding second serving and a la carte sales (Britten, 2006; Glesne, 2006).

**Quantitative.** The quantitative component of this case study was a geographical cluster of data on school lunch purchases from all K-5 elementary schools within one district in the mid-Atlantic region. Existing school computer records that detail purchase data about second serving and a la carte purchases made by elementary students were collected and analyzed. The data selected were from one month, October 2011, and separate grade level categories were analyzed for significance. This month was chosen as the month for analysis because school began in late August, the month of September might have been impacted by a lack of

familiarity with the school lunch line, and the months of November and December were broken up into differing weeks based on observed holidays. The first and second page of the report included each a la carte item sold, by name, and the total sales per day by grade level for each school. The third page of the report data included the total number of lunches and second serving entrees sold, by grade level, for each school. (Unfortunately, this report did not include purchasing patterns by race/ethnicity.) All data were entered and maintained in the Statistical Package for Social Sciences (SPSS) software version 20.0 (Chicago, Il.) for analysis.

**Qualitative.** The qualitative component of this case study included interviews with five selected elementary school cafeteria managers, using purposeful sampling, from the school district being studied, as well as informal observations of the school cafeteria environment at those five schools in order to identify how extra food items were presented and sold. The five schools selected represent 45% of the elementary student population within the school district. The cafeteria school managers were chosen based on the total number of children receiving a free or reduced lunch based on their socioeconomic status (SES). The two schools with the greatest number of students receiving free/reduced lunch were selected, Schools J and K, as well as the two schools with the lowest number of students receiving free/reduced lunch, Schools H and I. The remaining school, School B, was the one that ranked sixth, out of eleven, with regard to free/reduced lunch participants. At one of the elementary schools, I am currently an administrator, so I already had a pre-established relationship with the cafeteria

manager at that location. At the other elementary schools, there was no familiarity with anyone other than school administrators. Therefore, designing a method of selection that resulted in the most useful information, while eliminating the school where I have prior familiarity as a selection, were integral components to the design of this study. This method of purposeful selection met that criterion because the school where I work had the fourth lowest SES population during the 2011-12 school year and was not selected as an interview location. The interview guide is found in Appendix B.

The interviews were scheduled at each of the respective school locations at a time deemed convenient by each cafeteria manager. Each interview was semi-structured with a variety of open-ended questions, in order to attempt to capture rich descriptors from each of the participants. This enabled me to look for deeper relationships and similarities through connection strategies as outlined by Maxwell and Miller (2008), with the goal of capturing how cafeteria managers report selling second servings and a la carte items to elementary children. The interview sessions, lasting from 25-45 minutes, were each audio recorded with participant permission. In addition, brief notes of key words were taken throughout the session in order to note any non-verbal actions or to reflect key points (Britten, 2006).

Prior to each scheduled interview, the school cafeteria lunch line at two of the schools were informally observed, without children present, for placement of a la carte sales items and food layout. In addition, how a la carte items were sold to students during the lunch line progression was queried of each cafeteria manager as

the final question. Learning where food items were placed, and how children chose the various items to purchase, was valuable information in this study's design. In addition, observing whether any posters sent by the USDA, or any other items were on display was documented, and photographed if there were no children present in the cafeteria during this phase of the interview. The other cafeteria managers preferred that this project occur on only one day, to include photographing the lunch line and completing the interview, to save them time.

As each interview was completed, I downloaded the audio recording onto my computer as an mp3 file in my dropbox folder for easy retrieval and playback. Each of the audio recordings were transcribed, verbatim, into a Word document over a two week time period, and saved in dropbox coded by school names to protect the identity of those involved. Each of the interviews was transcribed by the researcher using a continuous playback strategy, by typing each word played on the recorder into a Word document. This allowed for improved accuracy, but also an opportunity to better contextualize each conversation, after allowing for time to process each of the conversations. Furthermore, any questionable content was verified through random selections by a fellow doctoral student, preserving all anonymity of the subjects. After the completion of each interview transcription, each audiotape was played again as the researcher reread the Word document to double check the accuracy of transcription.

## **Researcher Perspective**

Having worked in five different schools over the past twenty years, at both the elementary and high school levels, I have seen many different food items served to children. This first hand experience has created doubt and concern about the quality of food that children are given to sustain them each day. As a school administrator, I recognize that Cafeteria Managers are pressured to sell additional items to children by the Director of Food and Nutrition in each school district to improve profit margins, as learned through conversations with cafeteria staff in multiple districts. This includes chips, cookies and ice cream, in order to provide additional funding for the cafeteria budget. As a result of this understanding, I wanted to complete this case study about the extra item purchasing habits of elementary school children who participate in the NSLP within one school district in the United States.

Additionally, I wanted to further investigate how these extra food items were being prepared, presented, and sold to children each day by cafeteria managers and their staff. This information is important for policymakers to understand because of the potential caloric impact affecting elementary school children when they regularly purchase these additional food items. Better understanding about the complete sales process of these extra food items can inform policymakers about the hidden phenomenon of second serving and a la carte purchases in the NSLP. Ultimately, investigating and analyzing how these items are sold to children, as well as determining the actual amount of extra food items purchased by students each

day, would also help reveal this phenomenon to parents, schools, and researchers in order to improve the NSLP.

### **Participants and Setting**

**Site selection.** By choosing a single-case design, it was challenging to determine what would establish a case, yet be sufficient to represent the number and amount of children making additional daily food item purchases. There are a total of eleven elementary schools in this district, representing one county in the state. Choosing all eleven elementary schools within a mid-sized school district represented data on more than 5,000 elementary age students and provided a substantial sample size of grade level variety for comparison. For the purposes of this dissertation, it was believed that this would be a representative sample of the region, as well as a starting point for other researchers to consider for future attempts to replicate or extend this study.

The school district selected for the study was chosen primarily for its location near a major metropolitan city, as well as its large geographic size. In addition, this district was chosen based on convenience and accessibility because of prior work experience in that district by the researcher. The school district is considered mid-sized for the mid-Atlantic region, covering 651 square miles. The large size represented by this district provided students from a variety of socioeconomic, racial, and ethnic backgrounds. The demographics for the district in school year 2010-11 reflected total enrollment of 11,138 students. Ethnicity rates were as follows: 74.9% White, 10.3% Hispanic, 9.7% Black, 2.9% Multiple Races,

1.8% Asian, 0.36% American Indian, and 0.05% Hawaiian. Students who receive free lunch in this district total 22.7%, and 11.04% receive special education services. This district was a convenience location because I work in this particular school district and have developed solid relationships with the central office staff, as well as staff and family members within the school where I work. Although this is a limitation with regard to the data analysis, the benefits were believed to far outweigh the limitations due to the increased access to such a large amount of information.

**School Sites.** The elementary level was selected because students at the middle and high school level have far more autonomy with lunch choices, and can purchase only a la carte items for lunch, if so desired. Elementary students, on the other hand, must purchase an entire school lunch if they are buying lunch that day. (Students may purchase drinks if they brought a bag lunch.) Examples of additional food options available for purchase by students, after a full lunch purchase, include second servings of the main entrée, a roll, a cookie, an ice cream, a frozen fruit juice bar, an individual bag of chips, or an extra fruit juice, iced tea, or water. With eleven elementary schools in this district, choosing to use only one school would have significantly limited findings. It would only have represented the neighborhoods served by the one school, rather than a regional sample. Using all elementary schools within the district allowed for the demographics of the entire county to be factored into the study. Total demographic information for the 5,103 elementary

students enrolled in the district as of January 11, 2012 for the 2011-12 school year, reflecting new ethnicity categories, are listed in Table 3.1.

Table 3.1  
*District Elementary Ethnicity Percentages*

Ethnicity	Percentage
White	72.64%
Black/African American	9.29%
Hispanic Multiracial	5.29%
Hispanic White	4.31%
Multiracial	3.59%
Asian	2.16%
Hispanic American Indian	1.98%
American Indian/Alaska Native	0.25%
Hispanic Hawaiian	0.20%
Hispanic Black	0.12%
Hispanic Asian	0.10%
Native Hawaiian	0.08%

**School A.** School A had a student population of 489 students, as of December 2011, with the following grade level breakdown: Kindergarten 69, first grade 82, second grade 90, third grade 74, fourth grade 97, and fifth grade 77 (see Table 3.2 for a breakdown of each school’s student membership, by grade level). The ethnic demographics were as follows: 72.82% White, 9.33% Black/African American, 4.76% Asian, 4.75% Hispanic Multiracial, 4.37% Hispanic White, 2.58% Multiracial, and 1.39% Hispanic American Indian. The number of students who received free



lunch was 17.13% of the total student population, and those who received the reduced lunch rate totaled 5.58%.

**School B.** School B had a student population of 585 children, as of December 2011, with the following grade level breakdown: Kindergarten 97, first grade 93, second grade 89, third grade 100, fourth grade 109, and fifth grade 97. The ethnic demographics were as follows: 67.11% White, 15.45% Black/African American, 1.66% Asian, 3.16% Hispanic Multiracial, 6.15% Hispanic White, 4.65% Multiracial, 1.66% Hispanic American Indian, and 0.17% American Indian/Alaska Native. The number of students who received free lunch was 23.50% of the total student population, and those who received the reduced lunch rate totaled 3.67%. The total free/reduced total rate was 27.17%, and was the median free/reduced value for elementary schools within the district; therefore, this school site was chosen as one of the cafeteria manager interview sites.

**School C.** School C had a student population of 341 children, as of December 2011, with the following grade level breakdown: Kindergarten 46, first grade 59, second grade 53, third grade 57, fourth grade 54, and fifth grade 72. The ethnic demographics were as follows: 78.06% White, 3.42% Black/African American, 0.57% Asian, 4.27% Hispanic Multiracial, 7.98% Hispanic White, 3.99% Multiracial, 1.14% Hispanic American Indian, and 0.57% American Indian/Alaska Native. The number of students who received free lunch was 18.44% of the total student population, and those who received the reduced lunch rate totaled 4.90%.

**School D.** School D had a student population of 492 children, as of December 2011, with the following grade level breakdown: Kindergarten 75, first grade 69, second grade 70, third grade 76, fourth grade 105, and fifth grade 96. The ethnic demographics were as follows: 79.84% White, 4.74% Black/African American, 1.98% Asian, 3.16% Hispanic Multiracial, 2.77% Hispanic White, 5.34% Multiracial, 0.40% Hispanic American Indian, 0.40% American Indian/Alaska Native, 0.59% Hispanic Black, 0.20% Native Hawaiian, and 0.59% Hispanic Hawaiian. The number of students who received free lunch was 10.32% of the total student population, and those who received the reduced lunch rate totaled 2.18%.

**School E.** School E had a student population of 476 children, as of December 2011, with the following grade level breakdown: Kindergarten 80, first grade 85, second grade 74, third grade 77, fourth grade 79, and fifth grade 81. The ethnic demographics were as follows: 63.82% White, 14.02% Black/African American, 1.42% Asian, 0.41% Hispanic Asian, 8.54% Hispanic Multiracial, 4.88% Hispanic White, 4.47% Multiracial, 2.03% Hispanic American Indian, 0.20% American Indian/Alaska Native, and 0.20% Hispanic Hawaiian. The number of students who received free lunch was 25.15% of the total student population, and those who received the reduced lunch rate totaled 7.10%.

**School F.** School F had a student population of 372 children, as of December 2011, with the following grade level breakdown: Kindergarten 67, first grade 63, second grade 67, third grade 66, fourth grade 52, and fifth grade 57. The ethnic demographics were as follows: 73.52% White, 13.11% Black/African American,

1.03% Asian, 5.66% Hispanic Multiracial, 0.51% Hispanic White, 3.34% Multiracial, and 2.83% Hispanic American Indian. The number of students who received free lunch was 28.53% of the total student population, and those who received the reduced lunch rate totaled 6.17%.

**School G.** School G had a student population of 533 children, as of December 2011, with the following grade level breakdown: Kindergarten 94, first grade 92, second grade 93, third grade 83, fourth grade 79, and fifth grade 90. The ethnic demographics were as follows: 71.46% White, 14.37% Black/African American, 1.12% Asian, 3.92% Hispanic Multiracial, 4.29% Hispanic White, 3.36% Multiracial, 0.56% Hispanic American Indian, 0.19% American Indian/Alaska Native, 0.19% Hispanic Black, 0.19% Native Hawaiian, and 0.37% Hispanic Hawaiian. The number of students who received free lunch was 27.07% of the total student population, and those who received the reduced lunch rate totaled 8.29%.

**School H.** School H had a student population of 461 children, as of December 2011, with the following grade level breakdown: Kindergarten 61, first grade 82, second grade 70, third grade 67, fourth grade 87, and fifth grade 95. The ethnic demographics were as follows: 85.39% White, 3.13% Black/African American, 3.34% Asian, 0.21% Hispanic Asian, 2.71% Hispanic Multiracial, 2.92% Hispanic White, 1.04% Multiracial, 1.04% Hispanic American Indian, and 0.21% American Indian/Alaska Native. The number of students who received free lunch was 9.87% of the total student population, and those who received the reduced lunch rate totaled 2.31%. The total free/reduced total rate was 12.18%, and was the second

lowest free/reduced value for elementary schools within the district; therefore, this school site was chosen as one of the cafeteria manager interview sites.

**School I.** School I had a student population of 457 children, as of December 2011, with the following grade level breakdown: Kindergarten 75, first grade 64, second grade 79, third grade 80, fourth grade 71, and fifth grade 88. The ethnic demographics were as follows: 79.09% White, 5.39% Black/African American, 3.88% Asian, 0.43% Hispanic Asian, 2.59% Hispanic Multiracial, 1.94% Hispanic White, 3.66% Multiracial, 1.51% Hispanic American Indian, 0.22% American Indian/Alaska Native, 0.22% Hispanic Black, 0.43% Native Hawaiian, and 0.65% Hispanic Hawaiian. The number of students who received free lunch was 7.10% of the total student population, and those who received the reduced lunch rate totaled 1.94%. The total free/reduced total rate was 9.04%, and was the lowest free/reduced value for elementary schools within the district; therefore, this school site was chosen as one of the cafeteria manager interview sites.

**School J.** School J had a student population of 279 children, as of December 2011, with the following grade level breakdown: Kindergarten 56, first grade 40, second grade 51, third grade 35, fourth grade 62, and fifth grade 35. The ethnic demographics were as follows: 56.64% White, 8.04% Black/African American, 2.10% Asian, 16.43% Hispanic Multiracial, 8.04% Hispanic White, 2.45% Multiracial, 5.59% Hispanic American Indian, 0.35% American Indian/Alaska Native, and 0.35% Hispanic Hawaiian. The number of students who received free lunch was 42.01% of the total student population, and those who received the

reduced lunch rate totaled 8.33%. The total free/reduced total rate was 50.34%, and was the highest free/reduced value for elementary schools within the district; therefore, this school site was chosen as one of the cafeteria manager interview sites.

**School K.** School K had a student population of 479 children, as of December 2011, with the following grade level breakdown: Kindergarten 81, first grade 82, second grade 89, third grade 70, fourth grade 69, and fifth grade 88. The ethnic demographics were as follows: 68.22% White, 7.69% Black/African American, 0.20% Hispanic Black, 1.42% Asian, 8.30% Hispanic Multiracial, 4.45% Hispanic White, 3.85% Multiracial, 5.26% Hispanic American Indian, and 0.61% American Indian/Alaska Native. The number of students who received free lunch was 36.90% of the total student population, and those who received the reduced lunch rate totaled 5.65%. The total free/reduced total rate was 42.55%, and was the second highest free/reduced value for elementary schools within the district; therefore, this school site was chosen as one of the cafeteria manager interview sites.

Table 3.2

*Student Population per Grade, by School*

School	Kinder- garten	First Grade	Second Grade	Third Grade	Fourth Grade	Fifth Grade	Total Student s	Free/ Reduce d Rates
A	69	82	90	74	97	77	489	22.71%
* B	97	93	89	100	109	97	585	27.17%
C	46	59	53	57	54	72	341	23.34%
D	75	69	70	76	105	96	491	12.50%
E	80	85	74	77	79	81	476	32.25%
F	67	63	67	66	52	57	372	34.70%
G	94	92	93	83	79	90	531	35.36%
* H	61	82	70	65	87	95	460	12.18%
* I	75	64	79	80	71	88	457	9.04%
* J	56	40	51	35	62	35	279	50.34%
* K	81	82	89	70	69	88	479	36.90%

\* School chosen as interview site.

**Participants.** Individual interviews were conducted with each of the cafeteria managers from five of the elementary schools in the district studied. The following schools were chosen based on the free/reduced lunch rates at each of the schools. The two schools with the highest rates, the two with the lowest rates, and the school with the median value of students who qualify for free/reduced lunch were chosen as interview sites in order to capture descriptors and details from cafeteria managers who work with a variety of children from different SES backgrounds. Additionally, the school with the median free/reduced value was chosen because it is “more robust” to outliers than mean values (Dimitrov, 2008, p.

73). School B has a free/reduced total rate of 27.17%, the median free/reduced value for elementary schools within the district; therefore, this school site was chosen as one of the cafeteria manager interview sites. Schools H and I had the lowest rates, and Schools J and K had the highest rates of students qualifying for free/reduced lunch, so were chosen as the other four interview sites.

The District Director of Food and Nutrition, who was very open and friendly about the study, facilitated the interviews. She had acknowledged in numerous conversations with the researcher how hard it is to balance the financial aspects of the business with the food quality that is available. In addition, the cafeteria manager at the school where I work was asked about how receptive other managers might be to answer questions about their lunch program, including second serving and a la carte sales. Her answer was very positive, indicating that most of the cafeteria managers in the district are friendly and open to such questioning. She met with me, and helped refine the interview questions that would be asked of the selected managers. Originally, I had created about 25 questions to ask the cafeteria managers; however, once I met with our school cafeteria manager, the questions were reduced to the seven listed in Appendix B.

The cafeteria managers were all responsive and helpful when they received the initial email requesting possible dates. I visited each of the school cafeterias in the Spring of 2012 in order to observe the layout of the cafeteria line and introduce myself to each of the cafeteria managers, after emailing each of them for dates that would not interfere with their cafeteria operations. All of the managers had several

years of experience as a cafeteria manager, ranging from 5 to 18 years, all in the same school district. Four of the managers had worked their entire career at the same school. Three of the managers preferred that the interview be completed on the same day that I was able to visit and photograph the lines. Two of the cafeteria managers were very busy and seemed relieved when I shared that interviewing them on a different day was ideal. This method of visiting first allowed me to see how each of the lunch lines operated, and was offered in order to consider possible add on questions that pertained to each particular cafeteria.

At each of the interviews, I went over the informed consent form; even though this study was exempt (Appendix A). I also shared the letter from the school superintendent, indicating that I had permission to complete the study. I attempted to build rapport by staying positive and friendly, and by assuring them that all information would be kept confidential. In addition, I assured each of them that this study was informational only, to help me complete my dissertation, and was providing helpful information that very few people knew much about. Questions focused on what additional food offerings were for sale, how items were chosen or changed, and what role the budget might play in additional food item sales (see Appendix B). In addition, each manager selected was asked to share how students progress through the lunch line and make second serving and a la carte purchases.

### **Data Collection**

All data about second serving and a la carte purchases were retrieved from the School Link Technologies WebSMARTT Point of Sale software program in use at



the school district studied. This software allows the Director of Food and Nutrition to immediately access and update, in real time, student and food information at the school level. This software also allows student accounts to transfer easily from one school to another if students move at any point during the school year. Custom reports are not accessible at the county level, however, and student profile information is not saved in any final reports. The program has applied for approval by the USDA to be used by schools for menu-planning purposes, but has not yet been approved. The county has been using this software for approximately ten years.

The Director of Food and Nutrition Services allowed the retrieval of the October 2011 data in February 2012, after receiving approval from George Mason University's Human Subject Review Board and the district superintendent. A user name and login was assigned to me in order to run reports that exported directly to Microsoft Excel. Each sales day in October 2011 was saved into password protected folders, labeled under each school name. In addition, the total sales numbers for the month of October 2011 were saved for each school in that same folder. The data files were each password protected with a case sensitive alphanumeric code, meaning that changes could not be made to it unless the correct password was entered. This was done to insure that changes were not accidentally made to any of the information, and to protect school district privacy if any of the three computers which housed the saved documents had been stolen or inappropriately accessed. The file was named OCT 2011 DATA and saved into Dropbox, a cloud server, on

three separate computers that were also alphanumeric password protected. Once received, the data were also transferred and saved to SPSS 20.0, and saved in Dropbox as an SPSS file to further protect and prevent the loss of data.

### **Quantitative Data Analysis**

**Statistical Reporting.** The first set of data were compiled into a frequency table, using Excel, reflecting the percentage of elementary students purchasing second serving entrees and a la carte purchases each day throughout the school district over a one month time span. The mean and median values for separate purchases were detailed by grade level at each of the individual schools, as well as for the entire school district. It will be important to share the median values because they are “more robust” to outliers than mean values (Dimitrov, 2008, p. 73). Additionally, all information was entered into a table, again by grade level, for inclusion in the final dissertation report.

**One-Factor Analysis of Variance (ANOVA).** A one-factor ANOVA was used in order to avoid the limitations of using pair-wise t-tests when assessing “mean differences among all groups” (Dimitrov, 2008, p. 215). The one factor ANOVA was run for every a la carte food item sold, and for each of the three second serving choices. The dependent variable in each case was the extra food item purchases made by students, and the independent variables were the six different grade levels represented (Kindergarten, first, second, third, fourth, and fifth).

## **Qualitative Data Analysis**

Cafeteria managers were asked seven questions during the semi-structured interview (Appendix B). There were set questions, but as new ideas arose, I attempted to obtain clarification through prompting. Themes and patterns in the interview data were analyzed using the constant-comparative method as advocated by Glaser and Straus (1967) and by categorizing the research data (Glesne, 2006). All interview data were sorted into analytic files by using a cross-case analysis (Yin, 2009). This allowed for the beginning of rudimentary coding schemes to be applied based on the key words that stood out, as outlined by Glesne (2006), in order for me to categorize the data. I also attempted to identify patterns and themes that represented the selling practices of cafeteria managers, in addition to looking for deeper relationships and similarities between interviewees, through connection strategies, as outlined by Maxwell (2005).

I went back through the interviews and decided that I needed to begin sorting my interview data into analytic files. This would allow me to begin applying rudimentary coding schemes based on the key words that had begun to stand out, as outlined by Glesne (2006). I was beginning to see patterns and relationships between each of the interviews and wanted to capture some of the vocabulary that reflected those similarities. I decided I was ready to print copies of each of the interviews, and took the opportunity to read them all again, from beginning to end, continuing to look for connections and relationships between them.

When making connections with the data, Maxwell and Miller (2008) recommend dissecting the data and then connecting them “into a relational order within an actual context” (p. 468). This resulted in a more holistic approach when analyzing the interviews, and helped me see the bigger picture of how additional food sales are occurring in elementary cafeterias. The final aspect of the interview analysis was the study of where each of the a la carte food items were placed, in the five different lunch lines, when each of the photos taken during the cafeteria walk-throughs were scrutinized.

After reading each of the transcripts several times, in addition to the time spent transcribing the interviews, I was able to develop a holistic narrative. The next step was to look at each interview one question at a time, and compare those to each of the different respondents. I transferred my interview transcripts into a grid, with the questions listed in column one, and each cafeteria manager’s response in the columns to the right. This allowed me to “see” the data for each question on one or more pages, depending on the length of their answers, and look for deeper relationships and similarities through connection strategies as outlined by Maxwell (2005). What I saw were strands of continuity between interviews, and similarities in thought.

After reading through the transcripts a third time, I finally went back through and began underlining and making notes about patterns and concepts in the margins. I also circled repeated and key words within the transcribed text. The following codes were identified to reflect the connections found through each of the

interviews: s (snack choices), p (student preferences), \$ (money), budg. (budget concerns), i.s. (increasing sales). Additional analytic memos were written in the margins to remind me to come back and revisit those sections when deciding how to share this data in the final report. This extended process brought me much closer to the data, and helped refine the process of categorizing each of the themes that emerged.

The initial categorization of themes was built on the key word coding throughout all of the interviews, and are as follows:

1. Variety of snack choices
2. Student preferences
3. Money availability
4. Budget impact
5. Increasing sales

From the patterns and relationships, I went back to my initial research question to consider how the interviews informed my research questions. I found it quite intriguing how closely related many topics were across all of the interviews, considering the socioeconomic differences between schools (described earlier in this chapter). I then wondered if the questions I asked, and the answers I received, would help guide me any closer to the answer(s) I was seeking. Ultimately, I wondered if my interviews would lead me toward potential school policy suggestions to address this seemingly unknown phenomenon of second serving and a la carte sales at the elementary level. I went back over the transcripts and

examined responses within the categories that most specifically answered my questions. Once I categorized the responses, I was able to move toward answering the final research question.

### **Limitations**

Although safeguards were used when constructing this study, there were limitations. First, the data were only extracted from one school district in one state in the mid-Atlantic region over a one-month period and assumes the school district represents a normal distribution. The results from such a study would likely meet with skepticism if generalization were projected to a much larger population in different regions of the United States. Second, data were only collected from the K-5 elementary level, with different numbers of students represented at each grade level. The lack of data from middle and senior high school students represents half the student population. Third, there were only five cafeteria managers interviewed. This small sample of cafeteria staff is not representative of the more than 80,000 schools serving school lunches through the NSLP in the United States. Finally, during the interview process it was discovered that not all schools allow Kindergarten students to purchase extra food items. This anomaly certainly would have skewed the findings about Kindergarten food purchases.

Key demographics about students are also missing; however, it is because the software used for student purchases does not keep track of race, SES, or gender when running sales reports. In addition, researcher bias is a potential limitation with the collection of both the quantitative and qualitative data. Because this is a

new area of study, it is hoped that this will help guide future research in larger districts and regions across the United States.

## **CHAPTER 4**

### **RESULTS**

This study was conducted in order to investigate to what degree extra food items are being purchased in school cafeterias that participate in the National School Lunch Program (NSLP). Knowing what food items are actually sold in elementary cafeterias, in one mid-sized school system in the mid-Atlantic region, could help inform future policy. This research is important, due to the new regulations that are set to begin in the 2012-13 school year based on the Healthy Hunger-Free Kids Act of 2010, which was enacted, in part, to reduce the childhood obesity epidemic. Because school cafeterias are now being targeted as potential supporters or barriers to the childhood obesity epidemic based on the amount of healthy food offerings available, the extra food items sold could reveal potential additional calories children purchase regularly, unbeknownst to most parents and policymakers. This chapter details the results of a case study that examined the degree to which extra food items were sold to elementary students in one school district in October 2011, as well as interview data from five cafeteria managers documenting the economic implications of a la carte and second serving sales. A la carte items are those extra food items not included in the daily lunch service, and second servings include a full second serving of one of the main entrées served



through the NSLP program. The research questions guided the study and initial review of the data, and more global considerations about policy implications were considered in the final chapter.

## **Quantitative Results**

### **Research Question 1**

Are elementary students purchasing second servings of main entrées and/or a la carte food items during lunch? If so, how often?

The first research question was created in an attempt to assess whether elementary aged children were purchasing extra food items and/or second servings of main entrées. The data collected revealed that children are buying second servings of entrées and a la carte items in this particular school district in large amounts. Children in grades Kindergarten through five in the studied school district purchased second servings of main entrees every school day in October 2011, as indicated in Table 4.1. Of the more than 50,000 main lunch entrée purchases made in October of 2011, 4.67% of them included the purchase of a second serving of the main entree. At first glance, this seemed rather small; however, upon closer scrutiny, it was discovered that most elementary schools do not allow Kindergarten and students to purchase a la carte or second servings. Thus, most of this analysis is limited to purchasing habits of children in grades 1-5. As few as 18 second servings were purchased on one day when a deli sub was the main entrée; whereas, 369 second servings were purchased when stuffed crust dippers were available as reflected in Table 4.2. Overall, children purchased 2,669 second servings of main

entrées in October 2011 (Table 4.3). In addition, 29,203 a la carte items were purchased by students in all elementary grades throughout the school district during October of 2011. That is an average of more than 1,460 extra food items sold to elementary aged school children each day.

Table 4.1

*Second Servings of the Main Entrée per Day, October 2011*

Date	Menu Item	Second Servings Sold
10/3/2011	Chicken Patty on Roll	73
10/4/2011	Stuffed Crust Dippers	369
10/5/2011	Italian Dunkers	85
10/6/2011	Chicken Nuggets	216
10/7/2011	Steak & Cheese on Roll	28
10/10/2011	HOLIDAY	
10/11/2011	Pizza	138
10/12/2011	Beef & Cheese Soft Taco	69
10/13/2011	Chicken Tenders	162
10/14/2011	Fish Nuggets	82
10/17/2011	Hot Dog on WW Roll	125
10/18/2011	Pizza	143
10/19/2011	Beef Teriyaki Bites	83
10/20/2011	Chicken Nuggets	186
10/21/2011	Manager Planned	56
10/24/2011	Chicken Patty on Roll	104
10/25/2011	Stuffed Crust Dippers	310
10/26/2011	Spaghetti w/Meat Sauce	92
10/27/2011	Deli Sub on WW Roll	18
10/28/2011	Manager Planned	79
10/31/2011	Toasted Cheese Sandwich w/Tomato Soup	20
	TOTAL	2,438

Table 4.2

*Second Servings, Least to Greatest, October 2011*

<b>Date</b>	<b>Menu Item</b>	<b>Second Servings Sold</b>
10/27/11	Deli Sub on WW Roll	18
10/31/11	Toasted Cheese Sandwich w/Tomato Soup	20
10/7/11	Steak & Cheese on Roll	29
10/21/11	Manager Planned	56
10/12/11	Beef & Cheese Soft Taco	69
10/3/11	Chicken Patty on Roll	73
10/28/11	Manager Planned	79
10/14/11	Fish Nuggets	82
10/19/11	Beef Teriyaki Bites	83
10/5/11	Italian Dunkers	85
10/26/11	Spaghetti w/Meat Sauce	92
10/24/11	Chicken Patty on Roll	104
10/17/11	Hot Dog on WW Roll	125
10/11/11	Pizza	138
10/18/11	Pizza	143
10/13/11	Chicken Tenders	162
10/20/11	Chicken Nuggets	186
10/6/11	Chicken Nuggets	216
10/25/11	Stuffed Crust Dippers	310
10/4/11	Stuffed Crust Dippers	369

Table 4.3

*Second Serving Purchases by Grade Level, October 2011*

Grade	Second Serving Entrée 1	Second Serving Entrée 2	Second Serving Entrée 3
K	3	1	0
1	10	7	0
2	239	3	1
3	563	13	8
4	732	44	3
5	891	123	13
TOTALS	2438	191	25

**Research Question 2**

What extra food items are children in elementary schools purchasing in school cafeterias?

There were 21 different food items available for a la carte purchase by elementary aged children in this school district, including milk, during October of 2011 (see Table 4.4). The sales rates of the various food items were clustered primarily around items that most nutritionists would consider unhealthy. Those food items that sold, on average, more than 20 per day for elementary students are listed in Table 4.5. The items with the highest sales rates were ice cream, at a cost of \$0.50 or \$0.55 each, chips, and cookies. The total number of ice cream products purchased by students was 6,499, averaging 324.9 per day across the eleven elementary schools. This means that 6.57% of the total elementary population bought ice cream in October 2011 (Table 4.4). Students purchased 5,767 chips and 5,038 cookies during October 2011, averaging more than 250 sales per day. The

combined sales of just those three food options average more than 850 per school day, bringing in a gross sales amount of approximately \$8500.00 during October of 2011.

Four of the five school cafeteria managers claimed during the interview process that healthy food items were available; however that data on these items were more difficult to analyze in the monthly sales reports. For example, more than 3,000 milks sold as an a la carte item in October, but there was not a method available to discern whether it was chocolate, whole, or low-fat white milk that children purchased. Children also purchased more than 500 frozen fruit juice bars made from 100% juice during the month of study. However, nutritionists advise that fruit juice has just as much sugar as most sodas, so its nutritional value is questionable in this case. In addition, the a la carte sales of vegetables indicated that 448 extra servings were sold, but anecdotal reports by cafeteria managers reflect that many of those sales were extra potato servings, usually in the form of French fries. Other options sold to students that appear to be healthier options were soup and yogurt, but those sales numbers were very small as a daily average as detailed in Table 4.6.

Table 4.4

*Total a La Carte Purchases, from Least to Greatest, October 2011*

<b>Food Items Sold Oct. 2011</b>	<b>Total Sales</b>	<b>Average Per Day</b>	<b>Percent of Population</b>
<b>Ice Cream \$1.00</b>	1	0.05	0.00%
<b>Soup</b>	2	0.1	0.002%
<b>Yogurt</b>	153	7.65	0.15%
<b>Pretzel</b>	154	7.7	0.16%
<b>Dinner Roll</b>	178	8.9	0.18%
<b>Cheese Cup</b>	232	11.6	0.23%
<b>Large Juice</b>	274	13.7	0.28%
<b>Crackers</b>	278	13.9	0.28%
<b>Small Juice</b>	348	17.4	0.35%
<b>Vegetable</b>	448	22.4	0.45%
<b>Frozen Fruit Juice</b>	538	26.9	0.54%
<b>Large Water</b>	825	41.25	0.83%
<b>Pudding</b>	1031	51.55	1.04%
<b>Rice Krispie</b>	1148	57.4	1.16%
<b>Capri Sun</b>	1491	74.55	1.51%
<b>Small Water</b>	1703	85.15	1.72%
<b>Ice Cream \$.55</b>	2967	148.35	3.00%
<b>Milk</b>	3086	154.3	3.12%
<b>Ice Cream \$.50</b>	3531	176.55	3.57%
<b>Cookie</b>	5048	252.4	5.10%
<b>Chips</b>	5767	288.35	5.83%
<b>TOTALS</b>	29203	1460.15	29.53%

Table 4.5

*High Volume Purchases, from Least to Greatest, October 2011*

<b>Food Items Sold Oct. 2011</b>	<b>Total Purchases Oct 2011</b>	<b>Average Per Day</b>
<b>Vegetable</b>	448	22.4
<b>Frozen Fruit Juice</b>	538	26.9
<b>Large Water</b>	825	41.25
<b>Pudding</b>	1031	51.55
<b>Rice Krispie</b>	1148	57.4
<b>Capri Sun</b>	1491	74.55
<b>Small Water</b>	1703	85.15
<b>Ice Cream \$.55</b>	2967	148.35
<b>Milk</b>	3086	154.3
<b>Ice Cream \$.50</b>	3531	176.55
<b>Cookie</b>	5048	252.4
<b>Chips</b>	5767	288.35

Table 4.6

*Sales of Healthier Options, from Least to Greatest, October 2011*

<b>Food Items Sold Oct. 2011</b>	<b>Total Sales</b>	<b>Percent of Population</b>
<b>Soup</b>	2	0.002%
<b>Yogurt</b>	153	0.15%
<b>Vegetables</b>	448	0.45%
<b>Fruit Ice Smoothie</b>	538	0.54%
<b>Large Water</b>	825	0.83%
<b>Small Water</b>	1703	1.72%
<b>Milk</b>	3086	3.12%

### **Research Question 3**

Are second serving main entrées and/or a la carte items purchased at different rates based on grade level?

$H_{01}$ :  $\mu_1 = \mu_2$ ; Second serving purchases are not affected by student grade level.

$H_A$ :  $\mu_1 \neq \mu_2$ ; Second serving purchases are affected by student grade level.

### **One-Factor Analysis of Variance (ANOVA)**

When looking at Table 4.7, there are statistically significant differences in the sale of extra food items when separated by grade level. Children in grades four and five are purchasing many more food items than children in the younger grades. For example, students in grade five purchased 7,204 items and students in grade one purchased 2,851. When scrutinized further, by running a one-factor analysis of variance (ANOVA), results vary greatly. An ANOVA was run in order to assess differences between the six grade levels and each a la carte and second serving purchase. The independent variable in each analysis was grade level, and the dependent variable were each of the extra food items purchased by students. After interviewing the cafeteria managers; however, it was learned that not all schools allow Kindergarten students to purchase extra food items. Therefore, the results described below should be considered with caution when comparing significant results between Kindergarten students and those in other grade levels.



Table 4.7

*A La Carte Total Sales, by Grade Level, October 2011*

<b>Food Items Sold Oct. 2011</b>	<b>Grade K Total</b>	<b>Grade 1 Total</b>	<b>Grade 2 Total</b>	<b>Grade 3 Total</b>	<b>Grade 4 Total</b>	<b>Grade 5 Total</b>	<b>Total Purchases Oct 2011</b>	<b>Average Per Day</b>	<b>Median Value</b>
Ice Cream \$1.00	0	0	0	0	0	1	1	0.05	0
Soup	0	0	0	0	0	2	2	0.1	0
Yogurt	17	46	35	12	17	26	153	7.65	22
Pretzel	0	1	4	30	60	59	154	7.7	17
Dinner Roll	0	4	13	23	52	86	178	8.9	18
Cheese Cup	40	63	36	40	22	31	232	11.6	38
Large Juice	2	12	114	67	16	63	274	13.7	40
Crackers	0	28	19	56	52	123	278	13.9	40
Small Juice	6	19	89	57	52	125	348	17.4	55
Vegetable	0	3	25	69	148	203	448	22.4	47
Frozen Fruit Juice	74	108	59	89	124	84	538	26.9	87
Large Water	7	104	140	124	181	269	825	41.25	132
Pudding	61	108	216	212	210	224	1,031	51.55	211
Rice Krispie	15	45	210	288	361	229	1,148	57.4	220
Capri Sun	11	149	241	353	336	401	1,491	74.55	289
Small Water	6	146	163	360	545	483	1,703	85.15	262
Ice Cream \$.55	45	299	690	635	727	571	2,967	148.35	603
Milk	347	480	404	571	685	599	3,086	154.3	526
Ice Cream \$.50	264	400	792	734	717	624	3,531	176.55	671
Cookie	93	362	882	955	1,300	1,456	5,048	252.4	919
Chips	159	474	1,164	1,110	1,315	1,545	5,767	288.35	1,137
<b>TOTALS</b>	<b>1147</b>	<b>2851</b>	<b>5296</b>	<b>5785</b>	<b>6920</b>	<b>7204</b>	<b>29,203</b>	<b>1460.15</b>	<b>73.008</b>

A one-way ANOVA was conducted that examined the effect of grade level on a la carte and second serving food purchases. The results are as follows:

**Milk.** A one-way ANOVA was conducted that examined the effect of grade level on all regular 1% white, 2% white, and fat-free chocolate milk purchases made in addition to the milk that is served as a component of a NSLP lunch sale. There was not homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of milk purchases,  $F(5, 60) = .527, p = .755, \eta_p^2 = .042$  (see Table 4.8). Posthoc analyses, using Tukey's HSD, also indicated no significant differences in purchase amounts by students in different levels of extra milk.

Table 4.8

*Milk A La Carte Purchase Analysis, SPSS Output*

Dependent Variable: MILK						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_LEVEL	(J) GRADE_LEVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0	1	-12.09	22.518	0.994	-78.38	54.2
	2	-5.18	22.518	1	-71.47	61.11
	3	-20.36	22.518	0.944	-86.65	45.92
	4	-30.73	22.518	0.748	-97.02	35.56
	5	-22.91	22.518	0.91	-89.2	43.38
1	0	12.09	22.518	0.994	-54.2	78.38
	2	6.91	22.518	1	-59.38	73.2
	3	-8.27	22.518	0.999	-74.56	58.02
	4	-18.64	22.518	0.961	-84.92	47.65
	5	-10.82	22.518	0.997	-77.11	55.47
2	0	5.18	22.518	1	-61.11	71.47
	1	-6.91	22.518	1	-73.2	59.38
	3	-15.18	22.518	0.984	-81.47	51.11
	4	-25.55	22.518	0.865	-91.83	40.74
	5	-17.73	22.518	0.969	-84.02	48.56
3	0	20.36	22.518	0.944	-45.92	86.65
	1	8.27	22.518	0.999	-58.02	74.56
	2	15.18	22.518	0.984	-51.11	81.47
	4	-10.36	22.518	0.997	-76.65	55.92
	5	-2.55	22.518	1	-68.83	63.74
4	0	30.73	22.518	0.748	-35.56	97.02
	1	18.64	22.518	0.961	-47.65	84.92
	2	25.55	22.518	0.865	-40.74	91.83
	3	10.36	22.518	0.997	-55.92	76.65
	5	7.82	22.518	0.999	-58.47	74.11
5	0	22.91	22.518	0.91	-43.38	89.2
	1	10.82	22.518	0.997	-55.47	77.11
	2	17.73	22.518	0.969	-48.56	84.02
	3	2.55	22.518	1	-63.74	68.83
	4	-7.82	22.518	0.999	-74.11	58.47
Grade 0 = Kindergarten						
Based on observed means.						
The error term is Mean Square(Error) = 2788.821.						

**Small juice.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of small juice purchases,  $F(5, 60) = 1.599, p = .174, \eta_p^2 = .118$  (see Table 4.9). Posthoc analyses, using Tukey's HSD, also indicated no significant differences by students in different grade levels of small juice drinks purchase amounts.

Table 4.9

*Small Juice A La Carte Purchase Analysis, SPSS Output*

Dependent Variable: SM_JUICE						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L EVEL	(J) GRADE_L EVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
<b>0</b>	1	-1.18	4.48	1	-14.37	12.01
	2	-7.55	4.48	0.547	-20.73	5.64
	3	-4.64	4.48	0.904	-17.83	8.55
	4	-4.18	4.48	0.936	-17.37	9.01
	5	-10.82	4.48	0.168	-24.01	2.37
<b>1</b>	0	1.18	4.48	1	-12.01	14.37
	2	-6.36	4.48	0.715	-19.55	6.83
	3	-3.45	4.48	0.971	-16.64	9.73
	4	-3	4.48	0.985	-16.19	10.19
	5	-9.64	4.48	0.276	-22.83	3.55
<b>2</b>	0	7.55	4.48	0.547	-5.64	20.73
	1	6.36	4.48	0.715	-6.83	19.55
	3	2.91	4.48	0.987	-10.28	16.1
	4	3.36	4.48	0.974	-9.83	16.55
	5	-3.27	4.48	0.977	-16.46	9.92
<b>3</b>	0	4.64	4.48	0.904	-8.55	17.83
	1	3.45	4.48	0.971	-9.73	16.64
	2	-2.91	4.48	0.987	-16.1	10.28
	4	0.45	4.48	1	-12.73	13.64
	5	-6.18	4.48	0.739	-19.37	7.01
<b>4</b>	0	4.18	4.48	0.936	-9.01	17.37
	1	3	4.48	0.985	-10.19	16.19
	2	-3.36	4.48	0.974	-16.55	9.83
	3	-0.45	4.48	1	-13.64	12.73
	5	-6.64	4.48	0.677	-19.83	6.55
<b>5</b>	0	10.82	4.48	0.168	-2.37	24.01
	1	9.64	4.48	0.276	-3.55	22.83
	2	3.27	4.48	0.977	-9.92	16.46
	3	6.18	4.48	0.739	-7.01	19.37
	4	6.64	4.48	0.677	-6.55	19.83
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 110.403.</b>						

**Large juice.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of large juice purchases,  $F(5, 60) = 1.076, p = .383, \eta_p^2 = .082$  (see Table 4.10). Posthoc analyses, using Tukey's HSD, also indicated no significant differences by students in different grade levels of large juice drinks purchase amounts.

Table 4.10

*Large Juice Purchase Analysis, SPSS Output*

Dependent Variable: LG_JUICE						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L EVEL	(J) GRADE_L EVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0	1	-0.91	5.359	1	-16.69	14.87
	2	-10.18	5.359	0.412	-25.96	5.6
	3	-5.91	5.359	0.878	-21.69	9.87
	4	-1.27	5.359	1	-17.05	14.5
	5	-5.55	5.359	0.904	-21.32	10.23
1	0	0.91	5.359	1	-14.87	16.69
	2	-9.27	5.359	0.518	-25.05	6.5
	3	-5	5.359	0.936	-20.78	10.78
	4	-0.36	5.359	1	-16.14	15.41
	5	-4.64	5.359	0.953	-20.41	11.14
2	0	10.18	5.359	0.412	-5.6	25.96
	1	9.27	5.359	0.518	-6.5	25.05
	3	4.27	5.359	0.967	-11.5	20.05
	4	8.91	5.359	0.562	-6.87	24.69
	5	4.64	5.359	0.953	-11.14	20.41
3	0	5.91	5.359	0.878	-9.87	21.69
	1	5	5.359	0.936	-10.78	20.78
	2	-4.27	5.359	0.967	-20.05	11.5
	4	4.64	5.359	0.953	-11.14	20.41
	5	0.36	5.359	1	-15.41	16.14
4	0	1.27	5.359	1	-14.5	17.05
	1	0.36	5.359	1	-15.41	16.14
	2	-8.91	5.359	0.562	-24.69	6.87
	3	-4.64	5.359	0.953	-20.41	11.14
	5	-4.27	5.359	0.967	-20.05	11.5
5	0	5.55	5.359	0.904	-10.23	21.32
	1	4.64	5.359	0.953	-11.14	20.41
	2	-4.64	5.359	0.953	-20.41	11.14
	3	-0.36	5.359	1	-16.14	15.41
	4	4.27	5.359	0.967	-11.5	20.05
Grade 0 = Kindergarten						
Based on observed means.						
The error term is Mean Square(Error) = 157.982.						

**Small water.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did show a main effect of grade level on the rate of small water purchases,  $F(5, 60) = 3.379, p = .009, \eta_p^2 = .220$  (see Table 4.11). Posthoc analyses, using Tukey's HSD, also indicated significant differences in purchase amounts of small waters between students in Kindergarten, and those in grades four ( $p = .019$ ) and five ( $p = .052$ ). There were no significant differences between any other grade level and small water purchases.



Table 4.11

*Small Water Purchase Analysis, SPSS Output*

Dependent Variable: SM_WATER						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L LEVEL	(J) GRADE_L LEVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0	1	-12.73	14.818	0.955	-56.35	30.89
	2	-14.27	14.818	0.928	-57.89	29.35
	3	-32.18	14.818	0.266	-75.8	11.44
	4	-49.00*	14.818	0.019*	-92.62	-5.38
	5	-43.36	14.818	0.052	-86.99	0.26
1	0	12.73	14.818	0.955	-30.89	56.35
	2	-1.55	14.818	1	-45.17	42.08
	3	-19.45	14.818	0.777	-63.08	24.17
	4	-36.27	14.818	0.157	-79.89	7.35
	5	-30.64	14.818	0.318	-74.26	12.99
2	0	14.27	14.818	0.928	-29.35	57.89
	1	1.55	14.818	1	-42.08	45.17
	3	-17.91	14.818	0.831	-61.53	25.71
	4	-34.73	14.818	0.193	-78.35	8.89
	5	-29.09	14.818	0.375	-72.71	14.53
3	0	32.18	14.818	0.266	-11.44	75.8
	1	19.45	14.818	0.777	-24.17	63.08
	2	17.91	14.818	0.831	-25.71	61.53
	4	-16.82	14.818	0.865	-60.44	26.8
	5	-11.18	14.818	0.974	-54.8	32.44
4	0	49.00*	14.818	0.019*	5.38	92.62
	1	36.27	14.818	0.157	-7.35	79.89
	2	34.73	14.818	0.193	-8.89	78.35
	3	16.82	14.818	0.865	-26.8	60.44
	5	5.64	14.818	0.999	-37.99	49.26
5	0	43.36	14.818	0.052	-0.26	86.99
	1	30.64	14.818	0.318	-12.99	74.26
	2	29.09	14.818	0.375	-14.53	72.71
	3	11.18	14.818	0.974	-32.44	54.8
	4	-5.64	14.818	0.999	-49.26	37.99
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 1207.706</b>						
<b>* The mean difference is significant at the .05 level</b>						

**Large water.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of large water purchases,  $F(5, 60) = 1.971, p = .096, \eta_p^2 = .141$  (see Table 4.12). Posthoc analyses, using Tukey's HSD, also indicated significant differences in purchase amounts of small waters between students in Kindergarten, and those in grade five ( $p = .043$ ). There were no significant differences between any other grade level and large water purchases.

Table 4.12

*Large Water Purchase Analysis, SPSS Output*

Dependent Variable: LG_WATER						
Tukey HSD						
(I) GRADE_L EVEL	(J) GRADE_ LEVEL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
<b>0</b>	1	-8.82	7.932	0.875	-32.17	14.53
	2	-12.09	7.932	0.65	-35.44	11.26
	3	-10.64	7.932	0.761	-33.99	12.72
	4	-15.82	7.932	0.358	-39.17	7.53
	5	-23.82*	7.932	0.043 *	-47.17	-0.47
<b>1</b>	0	8.82	7.932	0.875	-14.53	32.17
	2	-3.27	7.932	0.998	-26.62	20.08
	3	-1.82	7.932	1	-25.17	21.53
	4	-7	7.932	0.949	-30.35	16.35
	5	-15	7.932	0.418	-38.35	8.35
<b>2</b>	0	12.09	7.932	0.65	-11.26	35.44
	1	3.27	7.932	0.998	-20.08	26.62
	3	1.45	7.932	1	-21.9	24.81
	4	-3.73	7.932	0.997	-27.08	19.62
	5	-11.73	7.932	0.679	-35.08	11.62
<b>3</b>	0	10.64	7.932	0.761	-12.72	33.99
	1	1.82	7.932	1	-21.53	25.17
	2	-1.45	7.932	1	-24.81	21.9
	4	-5.18	7.932	0.986	-28.53	18.17
	5	-13.18	7.932	0.562	-36.53	10.17
<b>4</b>	0	15.82	7.932	0.358	-7.53	39.17
	1	7	7.932	0.949	-16.35	30.35
	2	3.73	7.932	0.997	-19.62	27.08
	3	5.18	7.932	0.986	-18.17	28.53
	5	-8	7.932	0.913	-31.35	15.35
<b>5</b>	0	23.82*	7.932	0.043 *	0.47	47.17
	1	15	7.932	0.418	-8.35	38.35
	2	11.73	7.932	0.679	-11.62	35.08
	3	13.18	7.932	0.562	-10.17	36.53
	4	8	7.932	0.913	-15.35	31.35
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 346.085.</b>						
<b>* The mean difference is significant at the .05 level</b>						

**Capri Sun.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of Capri sun drink purchases,  $F(5, 60) = 2.016$ ,  $p = .089$ ,  $\eta_p^2 = .144$  (see Table 4.13). Posthoc analyses, using Tukey's HSD, also indicated no significant differences by students in different grade levels of Capri Sun drinks purchase amounts.

Table 4.13

*Capri Sun Purchase Analysis, SPSS Output*

Dependent Variable: CAPRI_SUN						
Tukey HSD						
(I) GRADE_L EVEL	(J) GRADE_L EVEL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
<b>0</b>	1	-12.55	13.319	0.934	-51.75	26.66
	2	-20.91	13.319	0.621	-60.12	18.3
	3	-31.09	13.319	0.197	-70.3	8.12
	4	-29.55	13.319	0.245	-68.75	9.66
	5	-35.45	13.319	0.098	-74.66	3.75
<b>1</b>	0	12.55	13.319	0.934	-26.66	51.75
	2	-8.36	13.319	0.988	-47.57	30.84
	3	-18.55	13.319	0.731	-57.75	20.66
	4	-17	13.319	0.797	-56.21	22.21
	5	-22.91	13.319	0.524	-62.12	16.3
<b>2</b>	0	20.91	13.319	0.621	-18.3	60.12
	1	8.36	13.319	0.988	-30.84	47.57
	3	-10.18	13.319	0.972	-49.39	29.03
	4	-8.64	13.319	0.987	-47.84	30.57
	5	-14.55	13.319	0.883	-53.75	24.66
<b>3</b>	0	31.09	13.319	0.197	-8.12	70.3
	1	18.55	13.319	0.731	-20.66	57.75
	2	10.18	13.319	0.972	-29.03	49.39
	4	1.55	13.319	1	-37.66	40.75
	5	-4.36	13.319	0.999	-43.57	34.84
<b>4</b>	0	29.55	13.319	0.245	-9.66	68.75
	1	17	13.319	0.797	-22.21	56.21
	2	8.64	13.319	0.987	-30.57	47.84
	3	-1.55	13.319	1	-40.75	37.66
	5	-5.91	13.319	0.998	-45.12	33.3
<b>5</b>	0	35.45	13.319	0.098	-3.75	74.66
	1	22.91	13.319	0.524	-16.3	62.12
	2	14.55	13.319	0.883	-24.66	53.75
	3	4.36	13.319	0.999	-34.84	43.57
	4	5.91	13.319	0.998	-33.3	45.12
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 975.667.</b>						

**Fruit.** There was not homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of frozen juice purchases,  $F(5, 60) = .198, p = .962, \eta_p^2 = .016$  (see Table 4.14). Posthoc analyses, using Tukey's HSD, also indicated no significant differences by students in different grade levels of frozen juice bar purchases.

Table 4.14

*Fruit Purchase Analysis, SPSS Output*

Dependent Variable: FRUIT						
Tukey HSD						
(I) GRADE_L EVEL	(J) GRADE_ LEVEL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
<b>0</b>	1	-3.09	6.761	0.997	-22.99	16.81
	2	1.36	6.761	1	-18.54	21.27
	3	-1.36	6.761	1	-21.27	18.54
	4	-4.55	6.761	0.984	-24.45	15.36
	5	-0.91	6.761	1	-20.81	18.99
<b>1</b>	0	3.09	6.761	0.997	-16.81	22.99
	2	4.45	6.761	0.986	-15.45	24.36
	3	1.73	6.761	1	-18.18	21.63
	4	-1.45	6.761	1	-21.36	18.45
	5	2.18	6.761	1	-17.72	22.09
<b>2</b>	0	-1.36	6.761	1	-21.27	18.54
	1	-4.45	6.761	0.986	-24.36	15.45
	3	-2.73	6.761	0.999	-22.63	17.18
	4	-5.91	6.761	0.951	-25.81	13.99
	5	-2.27	6.761	0.999	-22.18	17.63
<b>3</b>	0	1.36	6.761	1	-18.54	21.27
	1	-1.73	6.761	1	-21.63	18.18
	2	2.73	6.761	0.999	-17.18	22.63
	4	-3.18	6.761	0.997	-23.09	16.72
	5	0.45	6.761	1	-19.45	20.36
<b>4</b>	0	4.55	6.761	0.984	-15.36	24.45
	1	1.45	6.761	1	-18.45	21.36
	2	5.91	6.761	0.951	-13.99	25.81
	3	3.18	6.761	0.997	-16.72	23.09
	5	3.64	6.761	0.994	-16.27	23.54
<b>5</b>	0	0.91	6.761	1	-18.99	20.81
	1	-2.18	6.761	1	-22.09	17.72
	2	2.27	6.761	0.999	-17.63	22.18
	3	-0.45	6.761	1	-20.36	19.45
	4	-3.64	6.761	0.994	-23.54	16.27
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 251.433.</b>						

**Cookie.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did show a main effect of grade level on the rate of cookie purchases,  $F(5, 60) = 5.372, p < .000, \eta_p^2 = .309$  (see Table 4.15). Posthoc analyses, using Tukey's HSD, also indicated significant differences in purchase amounts of cookies between students in Kindergarten, and those in grades four ( $p = .005$ ) five ( $p = .001$ ). There were also significant differences between students in grades one and five ( $p = .015$ ) and their cookie purchases. In addition, differences in purchasing rates between children in grades one and four approached significance ( $p = .054$ ).



Table 4.15

## Cookie Purchase Analysis, SPSS Output

Dependent Variable: COOKIE						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L EVEL	(J) GRADE_L EVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0	1	-24.45	29.273	0.96	-110.63	61.72
	2	-71.73	29.273	0.156	-157.9	14.45
	3	-78.36	29.273	0.095	-164.54	7.81
	4	-109.73*	29.273	0.005 *	-195.9	-23.55
	5	-123.91*	29.273	0.001 *	-210.08	-37.73
1	0	24.45	29.273	0.96	-61.72	110.63
	2	-47.27	29.273	0.592	-133.45	38.9
	3	-53.91	29.273	0.448	-140.08	32.27
	4	-85.27	29.273	0.054	-171.45	0.9
	5	-99.45*	29.273	0.015 *	-185.63	-13.28
2	0	71.73	29.273	0.156	-14.45	157.9
	1	47.27	29.273	0.592	-38.9	133.45
	3	-6.64	29.273	1	-92.81	79.54
	4	-38	29.273	0.785	-124.17	48.17
	5	-52.18	29.273	0.484	-138.36	33.99
3	0	78.36	29.273	0.095	-7.81	164.54
	1	53.91	29.273	0.448	-32.27	140.08
	2	6.64	29.273	1	-79.54	92.81
	4	-31.36	29.273	0.891	-117.54	54.81
	5	-45.55	29.273	0.63	-131.72	40.63
4	0	109.73*	29.273	0.005 *	23.55	195.9
	1	85.27	29.273	0.054	-0.9	171.45
	2	38	29.273	0.785	-48.17	124.17
	3	31.36	29.273	0.891	-54.81	117.54
	5	-14.18	29.273	0.997	-100.36	71.99
5	0	123.91*	29.273	0.001 *	37.73	210.08
	1	99.45*	29.273	0.015 *	13.28	185.63
	2	52.18	29.273	0.484	-33.99	138.36
	3	45.55	29.273	0.63	-40.63	131.72
	4	14.18	29.273	0.997	-71.99	100.36
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 4713.118.</b>						
<b>* The mean difference is significant at the .05 level</b>						

**Chips.** There was not homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did show a main effect of grade level on the rate of chip purchases,  $F(5, 60) = 6.691, p < .000, \eta_p^2 = .358$  (see Table 4.16). Posthoc analyses, using Tukey's HSD, also indicated significant differences in purchase amounts of chips between students in Kindergarten, and those in grades two ( $p = .012$ ), three ( $p = .021$ ), four ( $p = .002$ ), and five ( $p < .000$ ). There were also significant differences with chip purchases between students in grades one and five ( $p = .006$ ). Differences approached significance between children in grades one and four ( $p = .056$ ).

Table 4.16

Chip Purchase Analysis, SPSS Output

Dependent Variable: CHIPS						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L EVEL	(J) GRADE_ LEVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0	1	-28.64	26.395	0.885	-106.34	49.06
	2	-91.36*	26.395	0.012*	-169.06	-13.66
	3	-86.45*	26.395	0.021*	-164.16	-8.75
	4	-105.09*	26.395	0.002*	-182.79	-27.39
	5	-126.00*	26.395	0.000*	-203.7	-48.3
1	0	28.64	26.395	0.885	-49.06	106.34
	2	-62.73	26.395	0.181	-140.43	14.97
	3	-57.82	26.395	0.257	-135.52	19.88
	4	-76.45	26.395	0.056	-154.16	1.25
	5	-97.36*	26.395	0.006*	-175.06	-19.66
2	0	91.36*	26.395	0.012*	13.66	169.06
	1	62.73	26.395	0.181	-14.97	140.43
	3	4.91	26.395	1	-72.79	82.61
	4	-13.73	26.395	0.995	-91.43	63.97
	5	-34.64	26.395	0.777	-112.34	43.06
3	0	86.45*	26.395	0.021*	8.75	164.16
	1	57.82	26.395	0.257	-19.88	135.52
	2	-4.91	26.395	1	-82.61	72.79
	4	-18.64	26.395	0.981	-96.34	59.06
	5	-39.55	26.395	0.667	-117.25	38.16
4	0	105.09*	26.395	0.002*	27.39	182.79
	1	76.45	26.395	0.056	-1.25	154.16
	2	13.73	26.395	0.995	-63.97	91.43
	3	18.64	26.395	0.981	-59.06	96.34
	5	-20.91	26.395	0.968	-98.61	56.79
5	0	126.00*	26.395	0.000*	48.3	203.7
	1	97.36*	26.395	0.006*	19.66	175.06
	2	34.64	26.395	0.777	-43.06	112.34
	3	39.55	26.395	0.667	-38.16	117.25
	4	20.91	26.395	0.968	-56.79	98.61
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 3831.794.</b>						
<b>* The mean difference is significant at the.05 level</b>						

**Fifty cent ice cream.** There was not homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of \$0.50 ice cream purchases,  $F(5, 60) = 1.320, p = .268, \eta_p^2 = .099$  (see Table 4.17). Posthoc analyses, using Tukey's HSD, also indicated no significant differences of \$0.50 ice cream sales by students in different grade levels.

Table 4.17

*Fifty Cent Ice Cream Purchase Analysis, SPSS Output*

<b>Dependent Variable: ICE_CREAM50</b>						
<b>Tukey HSD</b>						
					95% Confidence Interval	
<b>(I) GRADE_L EVEL</b>	<b>(J) GRADE_L EVEL</b>	<b>Mean Difference (I-J)</b>	<b>Std. Error</b>	<b>Sig.</b>	<b>Lower Bound</b>	<b>Upper Bound</b>
<b>0</b>	1	-12.36	23.532	0.995	-81.64	56.91
	2	-48	23.532	0.333	-117.27	21.27
	3	-42.73	23.532	0.464	-112	26.55
	4	-41.18	23.532	0.505	-110.46	28.09
	5	-32.73	23.532	0.732	-102	36.55
<b>1</b>	0	12.36	23.532	0.995	-56.91	81.64
	2	-35.64	23.532	0.657	-104.91	33.64
	3	-30.36	23.532	0.789	-99.64	38.91
	4	-28.82	23.532	0.823	-98.09	40.46
	5	-20.36	23.532	0.953	-89.64	48.91
<b>2</b>	0	48	23.532	0.333	-21.27	117.27
	1	35.64	23.532	0.657	-33.64	104.91
	3	5.27	23.532	1	-64	74.55
	4	6.82	23.532	1	-62.46	76.09
	5	15.27	23.532	0.987	-54	84.55
<b>3</b>	0	42.73	23.532	0.464	-26.55	112
	1	30.36	23.532	0.789	-38.91	99.64
	2	-5.27	23.532	1	-74.55	64
	4	1.55	23.532	1	-67.73	70.82
	5	10	23.532	0.998	-59.27	79.27
<b>4</b>	0	41.18	23.532	0.505	-28.09	110.46
	1	28.82	23.532	0.823	-40.46	98.09
	2	-6.82	23.532	1	-76.09	62.46
	3	-1.55	23.532	1	-70.82	67.73
	5	8.45	23.532	0.999	-60.82	77.73
<b>5</b>	0	32.73	23.532	0.732	-36.55	102
	1	20.36	23.532	0.953	-48.91	89.64
	2	-15.27	23.532	0.987	-84.55	54
	3	-10	23.532	0.998	-79.27	59.27
	4	-8.45	23.532	0.999	-77.73	60.82
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 3045.709.</b>						

**Fifty-five cent ice cream.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of \$0.55 ice cream purchases,  $F(5, 60) = 2.005, p = .091, \eta_p^2 = .143$  (see Table 4.18). Posthoc analyses, using Tukey's HSD, also indicated no significant differences of \$0.55 ice cream sales by students in different grade levels.

Table 4.18

*Fifty-five Cent Ice Cream Purchase Analysis, SPSS Output*

Dependent Variable: ICE_CREAM_55						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L EVEL	(J) GRADE_L EVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0	1	-23.09	24.302	0.931	-94.63	48.45
	2	-58.64	24.302	0.168	-130.18	12.9
	3	-53.64	24.302	0.25	-125.18	17.9
	4	-62	24.302	0.126	-133.54	9.54
	5	-47.82	24.302	0.373	-119.36	23.72
1	0	23.09	24.302	0.931	-48.45	94.63
	2	-35.55	24.302	0.689	-107.09	36
	3	-30.55	24.302	0.807	-102.09	41
	4	-38.91	24.302	0.601	-110.45	32.63
	5	-24.73	24.302	0.91	-96.27	46.81
2	0	58.64	24.302	0.168	-12.9	130.18
	1	35.55	24.302	0.689	-36	107.09
	3	5	24.302	1	-66.54	76.54
	4	-3.36	24.302	1	-74.9	68.18
	5	10.82	24.302	0.998	-60.72	82.36
3	0	53.64	24.302	0.25	-17.9	125.18
	1	30.55	24.302	0.807	-41	102.09
	2	-5	24.302	1	-76.54	66.54
	4	-8.36	24.302	0.999	-79.9	63.18
	5	5.82	24.302	1	-65.72	77.36
4	0	62	24.302	0.126	-9.54	133.54
	1	38.91	24.302	0.601	-32.63	110.45
	2	3.36	24.302	1	-68.18	74.9
	3	8.36	24.302	0.999	-63.18	79.9
	5	14.18	24.302	0.992	-57.36	85.72
5	0	47.82	24.302	0.373	-23.72	119.36
	1	24.73	24.302	0.91	-46.81	96.27
	2	-10.82	24.302	0.998	-82.36	60.72
	3	-5.82	24.302	1	-77.36	65.72
	4	-14.18	24.302	0.992	-85.72	57.36
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 3248.279.</b>						

**Pudding.** There was not homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of pudding purchases,  $F(5, 60) = 1.030$ ,  $p = .409$ ,  $\eta_p^2 = .080$  (see Table 4.19). Posthoc analyses, using Tukey's HSD, also indicated no significant differences of pudding sales by students in different grade levels.



Table 4.19

*Pudding Purchase Analysis, SPSS Output*

<b>Dependent Variable: PUDDING</b>						
<b>Tukey HSD</b>						
					95% Confidence Interval	
<b>(I) GRADE_LEVEL</b>	<b>(J) GRADE_LEVEL</b>	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
<b>0</b>	1	-3.72	8.562	0.998	-28.94	21.5
	2	-13.54	8.562	0.614	-38.76	11.68
	3	-13.17	8.562	0.641	-38.39	12.05
	4	-12.99	8.562	0.655	-38.21	12.23
	5	-14.26	8.562	0.559	-39.48	10.96
<b>1</b>	0	3.72	8.562	0.998	-21.5	28.94
	2	-9.82	8.356	0.847	-34.43	14.79
	3	-9.45	8.356	0.866	-34.07	15.16
	4	-9.27	8.356	0.875	-33.88	15.34
	5	-10.55	8.356	0.804	-35.16	14.07
<b>2</b>	0	13.54	8.562	0.614	-11.68	38.76
	1	9.82	8.356	0.847	-14.79	34.43
	3	0.36	8.356	1	-24.25	24.98
	4	0.55	8.356	1	-24.07	25.16
	5	-0.73	8.356	1	-25.34	23.88
<b>3</b>	0	13.17	8.562	0.641	-12.05	38.39
	1	9.45	8.356	0.866	-15.16	34.07
	2	-0.36	8.356	1	-24.98	24.25
	4	0.18	8.356	1	-24.43	24.79
	5	-1.09	8.356	1	-25.7	23.52
<b>4</b>	0	12.99	8.562	0.655	-12.23	38.21
	1	9.27	8.356	0.875	-15.34	33.88
	2	-0.55	8.356	1	-25.16	24.07
	3	-0.18	8.356	1	-24.79	24.43
	5	-1.27	8.356	1	-25.88	23.34
<b>5</b>	0	14.26	8.562	0.559	-10.96	39.48
	1	10.55	8.356	0.804	-14.07	35.16
	2	0.73	8.356	1	-23.88	25.34
	3	1.09	8.356	1	-23.52	25.7
	4	1.27	8.356	1	-23.34	25.88
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 384.012.</b>						

**Rice Krispie treat.** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of pudding purchases,  $F(5, 60) = 1.914$ ,  $p = .105$ ,  $\eta_p^2 = .138$  (see Table 4.20). Posthoc analyses, using Tukey's HSD, also indicated no significant differences of Rice Krispie treat sales by students in different grade levels.

Table 4.20

*Rice Krispie Treat Purchase Analysis, SPSS Output*

Dependent Variable: RICE_KRISPIE						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L EVEL	(J) GRADE_L EVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
<b>0</b>	1	-2.73	12.633	1	-39.92	34.46
	2	-17.73	12.633	0.725	-54.92	19.46
	3	-24.82	12.633	0.375	-62.01	12.37
	4	-31.45	12.633	0.144	-68.64	5.74
	5	-19.45	12.633	0.64	-56.64	17.74
<b>1</b>	0	2.73	12.633	1	-34.46	39.92
	2	-15	12.633	0.841	-52.19	22.19
	3	-22.09	12.633	0.506	-59.28	15.1
	4	-28.73	12.633	0.221	-65.92	8.46
	5	-16.73	12.633	0.771	-53.92	20.46
<b>2</b>	0	17.73	12.633	0.725	-19.46	54.92
	1	15	12.633	0.841	-22.19	52.19
	3	-7.09	12.633	0.993	-44.28	30.1
	4	-13.73	12.633	0.885	-50.92	23.46
	5	-1.73	12.633	1	-38.92	35.46
<b>3</b>	0	24.82	12.633	0.375	-12.37	62.01
	1	22.09	12.633	0.506	-15.1	59.28
	2	7.09	12.633	0.993	-30.1	44.28
	4	-6.64	12.633	0.995	-43.83	30.55
	5	5.36	12.633	0.998	-31.83	42.55
<b>4</b>	0	31.45	12.633	0.144	-5.74	68.64
	1	28.73	12.633	0.221	-8.46	65.92
	2	13.73	12.633	0.885	-23.46	50.92
	3	6.64	12.633	0.995	-30.55	43.83
	5	12	12.633	0.932	-25.19	49.19
<b>5</b>	0	19.45	12.633	0.64	-17.74	56.64
	1	16.73	12.633	0.771	-20.46	53.92
	2	1.73	12.633	1	-35.46	38.92
	3	-5.36	12.633	0.998	-42.55	31.83
	4	-12	12.633	0.932	-49.19	25.19
<b>Grade 0 = Kindergarten</b>						
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 877.821.</b>						

**Second serving (1).** There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did show a main effect of grade level on the rate of second serving 1 purchases,  $F(5, 60) = 11.430, p < .000, \eta_p^2 = .488$  (see Table 4.21). Posthoc analyses, using Tukey's HSD, also indicated significant differences in purchase amounts of second serving 1 food items between students in Kindergarten, and those children in grade three ( $p = .010$ ), four ( $p < .000$ ), and five ( $p < .000$ ). There were significant differences of second serving 1 purchases between students in grades one and three ( $p = .011$ ), four ( $p < .000$ ), and five ( $p < .000$ ). There were also significant differences of second serving 1 purchases between students in grades two and four ( $p = .032$ ), and five ( $p = .002$ ).

Table 4.21

*Second Serving 1 ANOVA Grade Level Comparisons*

Dependent Variable: ENTREE_1						
Tukey HSD						
(I) GRADE_LEVEL	(J) GRADE_LEVEL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0	1	-0.64	14.363	1	-42.92	41.64
	2	-21.45	14.363	0.669	-63.74	20.83
	3	-50.91*	14.363	.010*	-93.19	-8.63
	4	-66.27*	14.363	.000*	-108.55	-23.99
	5	-80.73*	14.363	0	-123.01	-38.45
1	0	0.64	14.363	1	-41.64	42.92
	2	-20.82	14.363	0.697	-63.1	21.46
	3	-50.27*	14.363	.011*	-92.55	-7.99
	4	-65.64*	14.363	.000*	-107.92	-23.36
	5	-80.09*	14.363	.000*	-122.37	-37.81
2	0	21.45	14.363	0.669	-20.83	63.74
	1	20.82	14.363	0.697	-21.46	63.1
	3	-29.45	14.363	0.327	-71.74	12.83
	4	-44.82*	14.363	.032*	-87.1	-2.54
	5	-59.27*	14.363	.002*	-101.55	-16.99
3	0	50.91*	14.363	.010*	8.63	93.19
	1	50.27*	14.363	.011*	7.99	92.55
	2	29.45	14.363	0.327	-12.83	71.74
	4	-15.36	14.363	0.891	-57.64	26.92
	5	-29.82	14.363	0.314	-72.1	12.46
4	0	66.27*	14.363	.000*	23.99	108.55
	1	65.64*	14.363	.000*	23.36	107.92
	2	44.82*	14.363	.032*	2.54	87.1
	3	15.36	14.363	0.891	-26.92	57.64
	5	-14.45	14.363	0.914	-56.74	27.83
5	0	80.73*	14.363	.000*	38.45	123.01
	1	80.09*	14.363	.000*	37.81	122.37
	2	59.27*	14.363	.002*	16.99	101.55
	3	29.82	14.363	0.314	-12.46	72.1
	4	14.45	14.363	0.914	-27.83	56.74

Based on observed means.  
 The error term is Mean Square(Error) = 1134.561.  
 \*. The mean difference is significant at the .05 level.

**Second serving (2).** This food sale was a second serving of either a peanut butter and jelly, or cheese sandwich. There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of second servings of choice two items,  $F(5, 60) = 1.172, p = .334, \eta_p^2 = .089$  (see Table 4.22). Posthoc analyses, using Tukey's HSD, also indicated no significant differences of second servings of item two sales by students in different grade levels.

Table 4.22

*Second Serving 2 ANOVA Grade Level Comparisons*

Dependent Variable: ENTREE_2						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_L EVEL	(J) GRADE_ LEVEL	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0	1	-0.55	5.624	1	-17.1	16.01
	2	-0.18	5.624	1	-16.74	16.37
	3	-1.09	5.624	1	-17.65	15.46
	4	-3.91	5.624	0.982	-20.46	12.65
	5	-11.09	5.624	0.37	-27.65	5.46
1	0	0.55	5.624	1	-16.01	17.1
	2	0.36	5.624	1	-16.19	16.92
	3	-0.55	5.624	1	-17.1	16.01
	4	-3.36	5.624	0.991	-19.92	13.19
	5	-10.55	5.624	0.427	-27.1	6.01
2	0	0.18	5.624	1	-16.37	16.74
	1	-0.36	5.624	1	-16.92	16.19
	3	-0.91	5.624	1	-17.46	15.65
	4	-3.73	5.624	0.985	-20.28	12.83
	5	-10.91	5.624	0.389	-27.46	5.65
3	0	1.09	5.624	1	-15.46	17.65
	1	0.55	5.624	1	-16.01	17.1
	2	0.91	5.624	1	-15.65	17.46
	4	-2.82	5.624	0.996	-19.37	13.74
	5	-10	5.624	0.487	-26.56	6.56
4	0	3.91	5.624	0.982	-12.65	20.46
	1	3.36	5.624	0.991	-13.19	19.92
	2	3.73	5.624	0.985	-12.83	20.28
	3	2.82	5.624	0.996	-13.74	19.37
	5	-7.18	5.624	0.796	-23.74	9.37
5	0	11.09	5.624	0.37	-5.46	27.65
	1	10.55	5.624	0.427	-6.01	27.1
	2	10.91	5.624	0.389	-5.65	27.46
	3	10	5.624	0.487	-6.56	26.56
	4	7.18	5.624	0.796	-9.37	23.74
Based on observed means.						
The error term is Mean Square(Error) = 173.948.						

**Second serving (3).** For the majority of schools, this food choice was an add-on for the salad lunch, such as extra egg, meat, or cheese. There was homogeneity of variance between groups as assessed by Levene's test for equality of error variances. Analysis of variance did not show a main effect of grade level on the rate of second servings of choice two items,  $F(5, 60) = .965, p = .446, \eta_p^2 = .074$  (see Table 4.23). Posthoc analyses, using Tukey's HSD, also indicated no significant differences of second servings of the third lunch choice sales by students in different grade levels.



Table 4.23

*Second Serving 3 ANOVA Grade Level Comparisons*

Dependent Variable: ENTREE_3						
Tukey HSD						
					95% Confidence Interval	
(I) GRADE_ LEVEL	(J) GRADE_ LEVEL	Mean Differenc e (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
<b>0</b>	1	0	0.69	1	-2.03	2.03
	2	-0.09	0.69	1	-2.12	1.94
	3	-0.73	0.69	0.897	-2.76	1.3
	4	-0.27	0.69	0.999	-2.3	1.76
	5	-1.18	0.69	0.528	-3.21	0.85
<b>1</b>	0	0	0.69	1	-2.03	2.03
	2	-0.09	0.69	1	-2.12	1.94
	3	-0.73	0.69	0.897	-2.76	1.3
	4	-0.27	0.69	0.999	-2.3	1.76
	5	-1.18	0.69	0.528	-3.21	0.85
<b>2</b>	0	0.09	0.69	1	-1.94	2.12
	1	0.09	0.69	1	-1.94	2.12
	3	-0.64	0.69	0.939	-2.67	1.39
	4	-0.18	0.69	1	-2.21	1.85
	5	-1.09	0.69	0.613	-3.12	0.94
<b>3</b>	0	0.73	0.69	0.897	-1.3	2.76
	1	0.73	0.69	0.897	-1.3	2.76
	2	0.64	0.69	0.939	-1.39	2.67
	4	0.45	0.69	0.986	-1.58	2.48
	5	-0.45	0.69	0.986	-2.48	1.58
<b>4</b>	0	0.27	0.69	0.999	-1.76	2.3
	1	0.27	0.69	0.999	-1.76	2.3
	2	0.18	0.69	1	-1.85	2.21
	3	-0.45	0.69	0.986	-2.48	1.58
	5	-0.91	0.69	0.774	-2.94	1.12
<b>5</b>	0	1.18	0.69	0.528	-0.85	3.21
	1	1.18	0.69	0.528	-0.85	3.21
	2	1.09	0.69	0.613	-0.94	3.12
	3	0.45	0.69	0.986	-1.58	2.48
	4	0.91	0.69	0.774	-1.12	2.94
<b>Based on observed means.</b>						
<b>The error term is Mean Square(Error) = 2.615.</b>						

## **Percent of Population**

Realizing that the number of children in each grade level varied, I wanted to make sure that all aspects of purchasing data were considered and evaluated in this analysis. In order to determine the percent of children in each grade level making a la carte purchases, a sales calculation was completed as follows. The total number of children in each grade level was taken and multiplied by the 20 sales days in October 2011 in order to come up with a total possible number (*tpn*) of sales opportunities. I then used that value and divided the total item sales by the *tpn* to calculate the percent of children purchasing each food item at each grade level (Table 4.24). This analysis assumes, however, that children are only allowed to purchase one a la carte food item per the district's policy. If any cafeterias within this study did not adhere to that standard rule, then these numbers would not be accurate. As Table 4.24 indicates below, more than 30% of children in each of grades two through four are purchasing extra food items, and 41.4% of children in grade five made extra food purchases in October of 2011.

Table 4.24

*A La Carte Sales Percent of Population, by Grade Level, October 2011*

Food Items Sold Oct. 2011	Grade K Percent	Grade 1 Percent	Grade 2 Percent	Grade 3 Percent	Grade 4 Percent	Grade 5 Percent
Milk	2.17%	2.97%	2.47%	3.67%	3.95%	3.44%
Small Juice	0.04%	0.12%	0.54%	0.37%	0.30%	0.72%
Large Juice	0.01%	0.07%	0.70%	0.43%	0.09%	0.36%
Small Water	0.04%	0.90%	1.00%	2.31%	3.14%	2.78%
Large Water	0.04%	0.64%	0.86%	0.80%	1.04%	1.55%
Capri Sun	0.07%	0.92%	1.47%	2.27%	1.94%	2.30%
Frozen Fruit Juice	0.46%	0.67%	0.36%	0.57%	0.71%	0.48%
Vegetable Soup	0.00%	0.02%	0.15%	0.44%	0.85%	1.17%
Yogurt	0.11%	0.28%	0.21%	0.08%	0.10%	0.15%
Dinner Roll	0.00%	0.02%	0.08%	0.15%	0.30%	0.49%
Crackers	0.00%	0.17%	0.12%	0.36%	0.30%	0.71%
Pretzel	0.00%	0.01%	0.02%	0.19%	0.35%	0.34%
Cookie	0.58%	2.24%	5.40%	6.14%	7.49%	8.37%
Chips	0.99%	2.93%	7.12%	7.13%	7.57%	8.88%
Cheese Cup	0.25%	0.39%	0.22%	0.26%	0.13%	0.18%
Ice Cream \$0.50	1.65%	2.48%	4.85%	4.72%	4.13%	3.59%
Ice Cream \$0.55	0.28%	1.85%	4.22%	4.08%	4.19%	3.28%
Ice Cream \$1.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Pudding	0.38%	0.67%	1.32%	1.36%	1.21%	1.29%
Rice Krispie	0.09%	0.28%	1.29%	1.85%	2.08%	1.32%
<b>TOTALS</b>	<b>7.16%</b>	<b>17.64%</b>	<b>32.41%</b>	<b>37.18%</b>	<b>39.86%</b>	<b>41.40%</b>

In summary, the quantitative findings above reveal that students in this mid-Atlantic district purchased 29, 203 extra food items and 2,654 second servings of

the main entrée during October 2011. The most popular a la carte items purchased by children were \$.50 or \$.55 ice cream, cookies, and chips. Items available, but rarely sold, included soup, yogurt, and vegetables. When the results were analyzed by grade level and after Kindergarten students were removed from the analysis due to inconsistent implementation of sales procedures at different schools, the extra food items purchased by children at significantly different rates were cookies, chips, and the main entrée second servings. Ultimately, it was revealed that more than 30% of children in grades two through four, and more than 40% of children in grade five, purchased extra food items during lunch in October 2011.

## **Qualitative Results**

### **Research Question 4**

How are cafeteria managers in the elementary schools of the selected school district implementing second serving and a la carte sales in the school setting?

Five elementary school cafeteria managers were interviewed based on the 2011-12 free/reduced lunch rates at each of the elementary schools, as illustrated in Table 3.2. School B was chosen with the free/reduced median (middle) value of 27.17%, Schools H and I had the lowest free/reduced rates, and Schools J and K had the highest rates of students qualifying for free/reduced lunch. The initial patterns and relationships identified from the interview data, as well as the categories that guided the analysis, resulted in better understanding about the sales process of extra food items. The results derived from the interviews are listed below, by each category created during the coding process. The initial categories that were created

during analysis enabled gathering rich examples of cafeteria manager understanding about the extra food items that are available for elementary children to purchase each day and the ordering process of those food items. Furthermore, each manager response and the pictures of the food layout in each cafeteria lunch line provided a better understanding of the economic impact of second servings and a la carte sales.

**Variety and availability of snack choices.** Each of the cafeteria managers listed a wide variety of choices available each day for students to purchase through a local vendor. The items listed by all of the managers were chips, cookies, ice cream, and Rice Krispie treats. Three of the cafeteria managers referred to pudding cups as big sellers, and two referred to popcorn. As illustrated in Figures 4.1 through 4.7, the variety of a la carte food options available for children to purchase is extensive. The only limit to the variety of items they could purchase for elementary sales was whether it was available through the contracted merchant and was tagged as an elementary item on the order list. Manager B reported that “we’re limited to what’s on bid as well with [supplier name] to what we can get, um, like we can’t get regular chips, we can only get like the hundred calorie snack” (personal communication, April 24, 2012).

The manager for School I presented the supplier order form and pointed out that baked chips were available for high school students, but not for the elementary level. Her guess as to why this is an issue is portion size, “Cause see these are an ounce, where these are 1.5, 1.12 (ounces)”. School K’s manager detailed the

importance of a snack selling regularly in order to continue ordering, as indicated by her comment, “I’m a big try-er of different things. If it works, then we’ll keep getting’ it, and if doesn’t work then we don’t” (personal communication, March 27, 2012). The majority of managers felt that having a wide selection of food items that the children wanted to purchase was important.



*Figure 4.1.* School B a la carte selections on the top shelf approximately 4-4.5 feet from the ground at eye level of older children, and a la carte water on the bottom shelf within easy reach for all children. (The carrots are a vegetable choice for lunch that day.)



*Figure 4.2.* School B ice cream choices, easily accessible at waist level by all students in the freezer built into the serving line.



*Figure 4.3.* School I a la carte choices on the top and bottom shelves. Choices include chips, pretzels, popcorn, water, and pudding. The items on the top shelf are approximately 4-4.5 feet from the ground at eye level; whereas, the items on the bottom shelf are within easy reach for all children at waist level.



*Figure 4.4.* School I cookies available for students at register, within easy reach of all children.



*Figure 4.5.* School J water a la carte choice at register, within easy reach of all children.





*Figure 4.6.* School K a la carte selections on the top shelf. The items on the top shelf are approximately 4-4.5 feet from the ground, but the tray is extended over the bottom shelf for easier viewing by older students.



*Figure 4.7.* School K pudding at eye level and water choices, within easy reach, are available for students.

**Student preferences.** All of the managers indicated concern about student preferences throughout each of the interviews. Additionally, the worry about what food items children like, or do not like, was evident when discussing lunch and a la carte sales. Managers expressed concern about elementary children not being able to do anything about their selected lunch choice once they leave the lunch line. If they get to the table and do not like a food item, the manager at School B indicated her concern for the children, “say you wanna try something new, and then you get it and you don’t like it, then you’re in trouble” (personal communication, April 24, 2012). She went on to share, “if it’s something that we know it’s gonna bomb, then we’ll throw, like, something else out there” (personal communication, April 24, 2012). She would rather the children eat something they like than to not eat at all until they get home. This concern was reflected by each of the managers as they discussed what children buy and eat for lunch each day.

The manager at School B discussed her efforts to make food available that would be served at home, and shared how she introduces food items for lunch:

Well, you don’t have to take the vegetable, but I would encourage them, hey try it. Like spinach, hey, it’s good with vinegar, so we gave ‘em little cups of vinegar, try it, something, cause that’s the way you would eat it... You wouldn’t eat it with nothin’ on it. (personal communication, April 24, 2012)

The other managers shared strategies they employed to try and get more children to put fruits and vegetables on their trays. The manager at School I had noticed that “they do like the broccoli pretty well, surprisingly enough... But, like the succotash,

they just won't eat it. I like it, but they don't like it. They don't like the lima beans" (personal communication, April 23, 2012). It is not required that students exit the lunch line with those food items, but managers shared how they try to get them to put them on their tray and expressed worry that they were not eating them more regularly.

...you got the fruits and the vegetables that they know, that when they get to the register if I suggest. We don't say you need, we just suggest, you know, you should go back and get a fruit. Like, if it's just, if they only have chicken nuggets and a milk, you need to go back, in some cases, and get either a vegetable or a fruit. And 99.9% of the time, they will go back. (School H, personal communication, May 2, 2012).

At the school with the lowest number of SES families, School H, extra food items available for sale as an a la carte or second serving are based specifically on what the children like to eat. The manager at School H detailed how popular the peanut butter and jelly sandwiches, Smuckers Uncrustables, were sold as an a la carte item to their students, at 210 calories each. That item was not listed specifically in the sales report on its own, and she did not share how that item was listed in the sales summary; therefore, the sales rates could not be calculated for October 2011. She was careful to say that all items were permissible to be sold to elementary children, "we've done pretzels, bags of pretzels, um, we've done animal cookies. Everything we have on there is basically items we are allowed to sell" (School H, personal communication, May 2, 2012).

The manager at School H also reflected concern about being limited with regard to what she could purchase, “we can’t just go out and buy certain things that we would love to buy, but yeah, we follow the Merchant’s order and usually, it’s pretty much what the kids like, and we, and I know what they like and I know what to order” (personal communication, May 2, 2012). She reflected confidence in her ability to order the food items that students at her school preferred to buy and eat. In School I, the different chip options were of particular focus, “Cheetos are a big deal, but they don’t care for the pretzels, and the French onion doesn’t go very well, but the garden salsa and the harvest chips are a big deal, and the little bags of popcorn, they like those” (personal communication, April 23, 2012). Making sure the children like the food options, so that they sell, were priorities shared by all of the interview managers.

The manager at School H was the only person who shared that she had completed a food interest survey to help her with future planning and ordering. She does serve the high income SES population, and shared that she wanted to be sure to sell food items the children liked to purchase.

...it was amazing what I saw. It was just amazing...the teacher just kind of filled it out for the class. But, some of them were putting, like, fish on there and steak, and goofy things, you know, but it was hilarious to see and, um, they, they just, they like spaghetti. It’s unusual, but they like spaghetti, they’d like to see more of that. They’d like to see more pizza, of course, you know,

the chicken nuggets, things, things like that. (personal communication, May 2, 2012)

Most answers shared by children about the food sold in the cafeteria in her survey were about the lunch options, rather than the extra a la carte food items available for sale. Manager H had not asked for input about those items.

At the school with the lowest levels of SES, the cafeteria manager noticed that the children liked and purchased the food items that other cafeteria managers complained about serving to their students due to poor sales levels.

...but they do like the, like the Salisbury steaks, stuff that other schools are telling me 'oh, my kids hate this at our school, you know, they won't even try it.' But I, like last year, brussel sprouts, I ordered those and, you know, I'll do two vegetables, and, you know, just put it out there, you know. We, you know, we do try to do a lot with the kids here. (School J, personal communication, March 28, 2012)

School J serves lunch to the largest number of poor children in the school district. Her worry about what students will eat was consistent with what the other managers discussed, but the food choices preferred at this school were reportedly different but not verifiable based on the monthly sales reports.

**Money availability.** At each of the five schools, the children are required to get their lunch and proceed to the cash register where they ask if they have money to purchase extras (see Figures 4.8 and 4.9). The children are aware that without the extra money in their account, they cannot purchase any extras, as noted by the

School H Manager. “We don’t offer it to ‘em at the beginning of the line, because if they don’t have money they’re not allowed to buy it anyway” (personal communication, May 2, 2012). However, she went on to note that “this school is a rich school, and they already know what they are allowed to do and what they’re not allowed to do, and really ... if you’ve got the money you can get it. But if you don’t, then simply said, you don’t get it” (School H, personal communication, May 2, 2012). Extra purchases were all based on money availability and knowledge about the process of the lunch line.



*Figure 4.8.* School H lunch line. The students enter and make milk and entrée choices first and place items on their trays at waist level.



*Figure 4.9.* School H lunch line continued. The students proceed to make fruit choices, and a la carte choices will be put out at waist and eye level after Kindergarten students move through the lunch line.

In School B, they follow the same procedure to purchase extra food items, “if they want extra a la carte, like if they want chicken nuggets, they come up and make sure they have the money, and then go back” (personal communication, April 24, 2012). At School I they follow a similar procedure, but the manager appeared more concerned about the child’s feelings rather than whether there was enough money in the account for the extra purchases. “They’ll, they come to me and they’ll say, ‘can I have a bag of chips or can I have a cookie?’ and I check their account. Then they go back and get it. It eliminates me having to take it from them, which I hate. I don’t like taking it from them” (Manager I, personal communication, April 23, 2012). She wanted the children to be able to buy extras, but did want them to be embarrassed or disappointed if they did not have sufficient funds.

**Lunch line photos.** Extra food items are on display and easy to grab when the majority of students progress through the line. The manager at school J also admitted that “some kids we know that always have money on their account, yeah if they ask, we’ll give, but it’s usually when they get to the register they’re seeing if they have the extra money to purchase them, then we’ll take the tray back to get a second a la carte” (personal communication, March 28, 2012). So, if it is a child who regularly purchases extras, they can potentially pick up their extra before getting to the cash register at School J as seen in Figure 4.10.



*Figure 4.10.* School I cookies available at the register for students to grab on their own before paying for lunch and any extra items.



The one difference in procedure was noted at School H with regard to how they sold ice cream products to students. They do not let the children buy their ice cream when they proceed through the lunch line. “They send us cash money down, we don’t take it off their account, they bring cash money in” (personal communication, May 2, 2012). In this school the children make their purchase first thing in the morning, separate from their lunch account, and the ice cream treats that were purchased are sent to the class in a plastic tub when the children are seated for lunch in the cafeteria, or at another time of day chosen by the teacher. The manager appeared pleased with this method, even though it was a result of the freezer closest to the cash register having been broken for the past several years.

**Budget impact.** Another barrier to snack availability that appeared to concern the cafeteria managers was their inability to sell extra food items to some grade levels. At School H, Kindergarten students were not allowed to purchase any a la carte or second serving items at all, per the school principal. The extra food items at School H were not even put out on display until after the Kindergarten students went through the lunch line, as evidenced in the photo of the lunch line (Figure 4.9). The principal at School J prohibited the sales of additional food items to any child in grade K, and the principal at School I would not allow the cafeteria to sell any extras to children in Kindergarten or First Grade, or to purchase second servings. The cafeteria manager at School I was concerned about the reduced sales opportunity, as indicated by her comments, “...and they don’t allow them to have second helpings of

food either. They get a straight lunch and get out. So, it affects my bottom line, a lot” (personal communication, April 23, 2012).

The manager in School J expressed concern about the lack of volume for extra item sales, especially due to reduced income levels of families who attend her school. Because so many children qualify for free/reduced lunch at this school, there is very little extra money for children to buy a la carte items or second servings. She shared, “we’re such a small school here, we don’t do, like, a lot of revenue. You know, I know, some days we’ll sell, like it’s getting warmer, we’ll sell a lot of waters and stuff, you know, so, we, we’re gaining some extra revenue” (Manager J, personal communication, March 28, 2012). At the higher SES schools, they acknowledged the budget impact, and hoped to sell more. The manager at School H said, “I feel like it impacts my budget quite a bit, and I would love to be able to sell more to keep that budget higher” (personal communication, May 2, 2012). School B, with the mid-level SES population, also shared how important the extra food items sales are to the regular cafeteria budget and acknowledged the level of impact as noted below.

Well, I know that without a la carte and the extra entrée we would probably be in the negative, and probably not end on a positive note at the end of the year. Because, really, technically, that’s where the money’s at. That’s where they make their money. (personal communication, April 24, 2012)

**Increasing sales.** All of the managers interviewed discussed the importance of increasing sale rates of breakfast and lunch; however, they all specifically wanted

to increase breakfast sales. The two schools (Schools J and K) with the highest number of free/reduced lunch rates were not concerned about lunch sales, per their report, because the high rates of free/reduced lunch resulted in higher lunch sales when compared to other schools. The manager for School K shared that “there’s a large free and reduced population here, which increases my meal sales too” (personal communication, March 27, 2012). She also hoped to increase her breakfast and lunch sales “anywhere from 1 – 5%. It depends on what my numbers were ending the year before” (personal communication, March 27, 2012).

Each of the managers who were interviewed interpreted efforts to increase sales with the USDA required monthly sales promotions. The manager at School I also identified pressure from the central office. “They certainly encourage any type of promotion. And, um, I have a form I have to fill out and send that in to let her know what I’ve done, and that I’ve done something” (personal communication, April 23, 2012). School B’s manager felt that her efforts should be put towards lunch sales, because she felt her breakfast sales were large enough. However, she went on to share that “I don’t really promote a la carte. Okay. It promotes itself. Right, there’s no, you can sell ice cream. It’s hard to sell spinach, but you can, you can sell ice cream” (personal communication, April 24, 2012). At the schools with low free/reduced lunch rates, they gave the impression that they did not worry about a la carte sales either based on the children having enough money at home. The manager at School H detailed how she did not have to promote sales because “the kids know. These kids are kinda different than other kids” because they have money

(personal communication, May 2, 2012). School I did not detail any sales promotions at all other than the one required each month by the USDA.

At Schools I and J, with the lowest SES populations, each manager reported completing their USDA sales promotions, but also that they would also like to increase breakfast sales. The manager for School J also detailed her efforts to “purchase like different vegetables, like spinach and stuff, and we’ll sample out with the kids and do like a promotion” (personal communication, March 28, 2012). However, School K’s manager shared that her lunch count stayed consistent at about 350 sales per day, regardless of promotions.

We have, like, breakfast promotions to encourage kids to come to breakfast. Um, and then we do certain lunch promotions, but my numbers don’t really change on that in terms of the number of kids that purchase lunch. I can get my breakfast numbers to pick up with a promotion but I haven’t really been able to get my lunch numbers to pick up. (personal communication, March 27, 2012)

The data above revealed a great deal of concern by each of the managers about the types of foods they were allowed to purchase and sell to students as an a la carte item. In addition, the level of free/reduced lunch students at each school appeared to impact the types of foods ordered and how each manager attempted to sell those extra items to children. In schools with a higher number of children receiving free and reduced lunch, the cafeteria offerings were more basic, and included water, ice cream, cookies, and chips. In schools with a lower number of

children receiving free and reduced lunch, the types of food choices were more expansive and sales rates of were much higher for other items such as crackers, pretzels, and pudding, in addition to the sales of chips, cookies, and ice cream.

### **Summary of Findings**

Data collected from the district detailed the sale of 29,203 a la carte food items during lunch, averaging approximately 1460 extra food items sold per day. When sales were compared to the total population, 29.53% of the elementary population purchased a la carte food items during the period studied. In addition to a la carte sales, second servings of main entrée items were sold to 4.67% of elementary students in grades 2 through 5 each day across the district. The most popular main entrée items sold as second servings were stuffed crust dippers and chicken nuggets, with sales ranging from 185-369 on days when those items were served. The least popular items sold as second servings were deli subs, toasted cheese sandwiches, and steak and cheese subs with sales ranging from 18-28 on days when those items were served.

Interviews with cafeteria managers indicated the importance of having a variety of food choices available to offer children for a la carte sales. All of the managers shared how they monitor what does or does not sell, and change offerings accordingly. Student preference was a strong indicator of what was purchased by the vendor and offered for sale. Some of the managers also shared how they needed to change a la carte offerings from year to year based on student preference fluctuating each year. All of the managers were confident that they knew what the

children liked and what they would buy; however, the manager at the school with the lowest number of free/reduced students sent out a survey querying student preference in order to help her plan for the following year.

Each school had a set process in place for children to follow who wish to purchase a la carte or second servings. The children were supposed to go through the lunch line first, see if they have extra money on their account, and then may go back and pick up the extra food item. All of the schools followed this rule, for the most part. The schools with the lowest number of free/reduced students were reported to already know whether they could purchase extras, and so did not always follow the above protocol. In addition, because the extra food items were already on display for all of the students, except one Kindergarten cohort, the children could potentially pick up their a la carte item before they get to the cash register.

The sale of extra food items to children during lunch is a driving force of each school cafeteria's budget. Each of the managers detailed how much the sale of extra food impacts their budget, and one went so far as to declare the sale of a la carte items as the main reason why the budget is met each year. Even with the knowledge that a la carte sales helps balance the budget, none of the cafeteria managers indicated that they attempted to promote the sales of those items. One manager admitted, during the interview, that those items do not need to be promoted. The children know what is for sale each day, and know how to purchase each item, if they have money in their account.

## CHAPTER 5

### CONCLUSION, DISCUSSION, AND IMPLICATIONS

The Richard B. Russell National School Lunch Act was created in order to feed hungry children in urban areas, and to have a guaranteed market for farmers (Gunderson, 1971, p. 19). The two conflicting roles have created a situation in American schools where feeding children is based on what farmers and large agribusinesses have available for sale, rather than offering healthy options based on children's physical needs. In addition, even though the USDA has set nutritional requirements, the majority of schools are not adhering to the guidelines because there are no sanctions in place (Gordon & Fox, 2007; Expectmore.gov, 2010). Consequently, children are being served food items during lunch that exceed calorie and fat requirements, potentially exacerbating the childhood obesity epidemic. Added to that issue is the allowance of extra food item sales, that include second servings of the main entrée and a la carte sales of snack type items. The purpose of this study was to reveal the sales rate of extra, or supplemental, food items during lunch to elementary school-aged students through the National School Lunch Program (NSLP), and to attempt to discover how these items were being presented to children by cafeteria staff.

The research questions that guided this study consisted of the following:

1. Are elementary students purchasing second servings of main entrées and/or a la carte food items during lunch? If so, how often?
2. What extra food items are children in elementary schools purchasing in school cafeterias?
3. Are second serving main entrées and/or a la carte items purchased at different rates based on grade level?
4. How are cafeteria managers in the elementary schools of the selected school district implementing second serving and a la carte sales in the school setting?

In order to attempt to answer these questions, a single-case design of mixed methodology was completed on an elementary school lunch program in one medium-sized school district in the mid-Atlantic region of the United States. A case study was ideal, in this study, in order to better understand how elementary-aged students are presented and are buying second serving/a la carte food items (Yin, 2009). As described in Chapter 3, the case studied was the second serving and a la carte purchasing behaviors of elementary school students in one medium sized school district. This chapter presents a brief summary of the results, implications and recommendations for the future, as well as suggestions for future research.

### **Discussion of Results**

Students in the district studied purchased 29, 203 extra food items and 2,654 second servings during October 2011. The most popular a la carte items sold to children were ice cream, cookies, and chips. Items available but rarely sold included



soup, yogurt, and vegetables. When the results were analyzed by grade level, the extra food items that sold to children at significantly different rates were cookies, chips, and the main entrée second servings after Kindergarten students were removed from the analysis. This was due to some schools not allowing Kindergarten students to purchase any a la carte or second servings during lunch. Ultimately, it was revealed that more than 30% of children in grades two through four, and more than 40% of children in grade five, purchased extra food items during lunch in October 2011.

The selected cafeteria managers who were interviewed, and allowed their cafeteria lines to be photographed, revealed concern about the eating habits of children and selling practices allowed by their central office and the USDA. The managers wanted to be able to have a variety of options available to them to sell to children each day, and did analyze their sales levels to order items that children would purchase. A major concern cited by each of the five managers was being able to serve items that the children liked/preferred so they would not go hungry. However, none of the managers felt comfortable requiring that children put additional fruits or vegetables on their tray and only made suggestions to children to go back and select these items. Each of the schools allowed children to purchase extras if they had enough money on their lunch accounts, and most had systems that included asking the cashier before putting the extra item on their lunch tray. The managers at schools where children in Kindergarten and/or Grade one could not purchase extra items reported concern about those grade level restrictions,

specifically how those restrictions impacted their budgets. None of the managers had sales goals for a la carte or second servings, because they felt those items were very easy to sell and necessary for the cafeteria budget.

## **Implications**

### **Calories**

Depending on activity levels, children in elementary school need 350-800 calories per meal (USDA, DHHS, *Dietary guidelines*, 2010). Historically the NSLP did not attempt to monitor caloric offerings per meal until the 2012-13 school year, and school cafeterias are not equipped to determine the caloric requirements for each child who proceeds through the lunch line. Based on the 2012-13 policy change, school lunches at the elementary level must now offer lunches between 550-650 calories (Shilling, 2012). Unfortunately, students who purchase competitive foods consume 38% more fat and twice the sugar of children who do not purchase competitive foods (Templeton, Marlette, & Panemangalore, 2005). Therefore, the food choices available to children should be healthier, and the a la carte and second serving choices should be more strictly regulated. Otherwise, children will continue consuming far more calories than they require and rates of overweight and obesity will continue to rise.

### **Portion Sizes**

The North Carolina School Nutrition Action Committee (SNAC) wrote a summary report for the USDA detailing the difficulties with portion sizes in America and its link to obesity (n.d.). This report details the ever-increasing portions offered

by restaurants in order to gain business and make sure that Americans believe they are getting the best value for their money, and that “portion distortion is now the norm” (p. 6). The specific recommendations made by the Committee detail the importance of not offering any a la carte food items for sale to elementary children “in order to help students learn to eat well-balanced meals that have been planned to meet nutrition standards” (p. 5). By allowing children to purchase and eat foods outside the offerings of the NSLP, schools are continuing the *portion distortion* habits that are currently contributing to the childhood obesity epidemic.

### **Cafeteria Budgets**

Even though cafeteria budgets are supposed to be separate from school budgets, they continue to be intertwined (Bartlett, Glantz, & Logan, 2008). Cafeteria staff members work within the school buildings, and serve school children meals every day. However, school administrators do not control the staff or food choices. Those decisions are made by outside administrative staff, usually staffed at a school districts central office. Those administrative costs have been estimated to be about 20% of the “total labor costs, and 10 percent of total full costs” (Bartlett, Glantz, & Logan, 2008, p. vii). The USDA subsidizes approximately 51% of the cost to run a school cafeteria, student payments from reduced/full price purchases cover approximately 24%, and State and local funds provide about 9% of total revenue. The only way to cover the remaining amount needed to run school cafeterias, according to most cafeteria managers and administrators, is to sell a la carte items (Bartlett, Glantz, & Logan, 2008).

In San Francisco, a budget analysis discovered that even with a la carte and vending sales, the cafeteria was still operating over budget (Christensen, 2010). A pilot program was implemented that eliminated all “junk food from the a la carte program and removed it from the vending machines... instead they sold freshly made deli sandwiches, salads, soup and even sushi” (n.p.). After only six months, that cafeteria was making a profit (Christensen, 2010). The argument made by food service staff that the only way to meet budgetary demands is to sell junk food is becoming harder to believe when new pilot programs are being started that show promise to combat the childhood obesity epidemic.

### **Agribusiness and Food Subsidies**

The food and beverage industry in the United States is very powerful. Many states have attempted to enact legislation taxing sodas in order to reduce consumption of the sugary drinks. However, of the 24 states and 5 cities that have tried this, all have failed. One state legislature, Washington, succeeded in passing the referendum, but the drink manufacturers launched a \$16 million dollar campaign to persuade voters against the two-cent tax (Wilson & Roberts, 2012). They report the amount of money spent by this industry has more than doubled in the past three years, spending \$175 million to thwart legislative change since 2008 (Wilson & Roberts, 2012).

At every level of government, the food and beverage industries won fight after fight during the last decade. They have never lost a significant political battle in the United States despite mounting scientific evidence of the role of

unhealthy food and children's marketing in obesity. (Wilson & Roberts, 2012, para. 3)

Although the food and beverage industry claims that it will voluntarily make healthier choices, the reality is that they continue to increase their profit margin as children become increasingly obese.

In November 2011, “Congress inserted a special interest provision” that changed the Healthy, Hunger-Free Kids Act of 2010 and reduced the health standards (U.S. House of Representatives Committee on Education, 2011). As a result of agri-business pressure, two tablespoons of tomato paste will now count as a vegetable serving, thus making it easier for pizza sauce to count as a vegetable. In addition, limits to reduce starchy vegetable servings (french fries and processed potatoes) to only twice per week were stopped. If the law were implemented as originally intended, without special interest pressure, then children would be receiving vegetables for lunch to meet the guidelines rather than tablespoons of a tomato paste and more servings of french fries.

Currently, fruits, vegetables, and nuts are defined as *specialty* crops and cannot be planted on subsidized farms (Mortazavi, 2011). Mortazavi posits that “the United States’ system of regulating food is fundamentally flawed” and that the current laws that regulate school lunches “may actually be contributing to the obesity crisis in children” (p. 1701-02). Industry groups are controlling the types of foods that make it to the cafeteria table, and profit margins are the guiding factor when planning commodities markets each year (USDA FNS, *USDA foods*, 2010, p. 6).

This type of business control over what children eat every day has created an obesity epidemic that might not be reversed quickly enough to save the children who are already affected. There should be increasing concern about the impact of agribusiness on food law in the United States. Initially, when the NSLP was created, its intent was to feed hungry, calorie-deprived children. However, in today's calorie surplus world, this goal is outdated and has created unhealthy, obese children.

Many opponents to healthier cafeteria food options do not consistently adhere to USDA guidelines and report that children will not eat the healthier options because they are used to eating unhealthy foods. That opinion is continually being challenged and seems to be inaccurate based on new research. California has additional competitive food standards in place for school lunch programs, and children are eating fewer calories, less sugar, and less fat than children in states without strict guidelines (Taber, Chriqui, & Chaloupka, 2012). In addition, those children do not compensate and consume more calories after school hours (p. 455). This implies that other states could certainly enact more stringent regulations on competitive foods sold in schools in order to reduce caloric intake for all children, if agri-businesses would step aside.

## **Media**

Home Box Office (HBO) partnered with the Institute of Medicine (IOM) and the Centers for Disease Control and Prevention (CDC) to create a four part series about the obesity epidemic (2012). This series is free to anyone who would like to watch it online, and was available at no cost on all cable provider channels when each episode originally aired on HBO. The first episode addressed the health and financial consequences of obesity. In the second episode in the series, the choices available to people to help them lose weight were discussed. The third episode focused solely on how obesity impacts children, and advocated the importance of schools providing healthy food options and exercise to all children every day. The final episode addressed the inequities facing Americans based on their zip code, and discussed the economic implications of subsidized crops. Offering this information series at no cost to Americans was publicized by all involved as a new era of working effectively with media outlets to help spread the message of how to live a healthy lifestyle.

More recently, the media has been a powerful influence over choices that schools and the public are making with regard to the food served to children. In addition, the media is beginning to demonstrate influence over some industries, such as television. For example, on June 5, 2012 the Disney channel announced that beginning in 2015, “all products advertised on its child-focused television channels, radio stations and Web sites must comply with a strict new set of nutritional standards” (Barnes, 2012). This includes all children’s programming on ABC on

Saturday mornings, and will impact current advertisers, such as Capri-Sun and sugary cereal makers, because they will no longer be eligible to advertise on any Disney channel marketed to children. Furthermore, the Disney parks will also reduce sodium in foods sold in their parks, and create public service announcements to address the need for increased exercise and improved eating habits. Disney owns multiple channels, including ABC and ESPN. Children watch many channels, so to truly impact the commercials that children see, it would make sense to eliminate inappropriate food commercials from all of the channels owned by Disney, not just those featuring children's programming.

Another area that has been impacted by the media is the recent reporting of *pink slime*. In March, there were several reports about the composition of pink slime, also known as lean beef trimmings, and how it plays a part in the school lunch program. Lean beef trimmings are made "by grinding together connective tissue and beef scraps normally destined for dog food and rendering, Beef Products, Inc. Lean Beef Trimmings are then treated with ammonia hydroxide, a process that kills pathogens such as salmonella and E. coli" (Knowles, 2012, para. 4). In the late 1990's, the USDA ruled that lean beef trimmings were safe, despite several other scientific reports that detail them as a "high risk product", and fast food chains will not use them in their burgers (Knowles, 2012, para. 11). The plan for the 2012-13 school year was for the USDA to purchase 7 million pounds of pink slime for the NSLP (Knowles, 2012). However, within ten days of the media report on both how this product was manufactured and added to ground beef, and the plan to feed it to



America's children, the USDA announced that schools could now choose whether the beef they purchased was 95% lean beef, plus the lean beef trimmings, or was a less lean version without pink slime (Castillo, 2012). Harnessing the power of the media to expose the foods served to children in the NSLP could help change current practice and improve the quality of food served to America's children.

### **Self-Regulation**

Currently many agri-business, beverage, and processing companies are pledging to self-regulate and improve nutrition and marketing standards by reducing the number of advertisements aimed specifically at children. This attempt to control the market has only led to minimal improvement. Companies are not required to participate in this marketing self-regulation movement. The few companies that did choose to self-regulate reduced their junk food advertisements aimed at children from 94 to 86% between the years 2003 and 2009 (Powell, Schermbeck, Szczypka, Chaloupka, & Braunschweig, 2011). Expecting a business of any kind to voluntarily self-regulate and potentially lose money will never result in the quick, effective change needed to reverse the childhood obesity epidemic.

### **Recommendations for Policymakers**

The NSLP was created, in part, to improve the nutritional health of starving children, and was publicized as solving a national safety issue (Gunderson, 1971); however, school cafeterias claim that serving children healthy food would be too costly. School administrators and cafeteria managers are also worried about federal requirements to raise the price of school lunches sold to the newly reimbursed rate

of \$2.78 due to a potential decline in sales. However, it is worrisome that concern about sales is the primary issue, rather than the health needs of children. It appears that the focus of policy has been continually on the needs of the farming and processed food companies rather than the needs of the children who require nutritional support each day.

### **Options to Consider**

In order to support the reduction in childhood obesity, and improve the health of children, Federal policy makers need to consider the following options for implementation at all U.S. schools that provide meals through the NSLP program:

Option #1 – Do nothing and hope that the implementation of the Healthy, Hunger-Free Kids Act of 2010 results in appropriate nutritional improvements for all school lunch programs;

Option #2 – Mandate and implement sanctions to align with the Healthy, Hunger-Free Kids Act of 2010, and all subsequent legislation, to require that all school lunch programs adhere to the nutritional, price, and certification requirements set forth in the Act; and/or

Option #3 – Separate the NSLP Agricultural Farming Commodities and School Lunch requirements into separate divisions in order to reduce the likelihood that special interest groups negatively influence the food that is served to U.S. children each school day; and/or

Option #4 – Encourage individual states to impose additional nutritional guidelines in order to avoid agribusiness lobbyist persuasion over federal

lawmakers, and eliminate the calorie dense a la carte and second serving options during lunch.

The NSLP, through the USDA, has become focused on the needs of agribusiness, and allowed special interest groups to control what food is served in U.S. schools. In addition, the nutritional requirements that have been in place have not been followed, yet those school lunch programs continue to receive funding. If current NSLP methods of operation are not adjusted, then nothing will change and obesity rates in children will continue to rise. Therefore, after analyzing current research and practice, it is recommended that the USDA and Department of Education work together to create and follow policy option #4 as quickly as possible, until lawmakers are able to proceed with options #2 and #3. It is imperative that schools provide and model appropriate foods choices in the school setting in order to teach children appropriate healthy eating habits for the future that include teaching children to eat appropriate portion and calorie allotments. If schools would begin to consistently provide healthy meals to children, by following appropriate nutritional and caloric guidelines rather than worrying about profit margins, then childhood obesity and overweight rates will hopefully begin to decline.

### **Recommendations for School Districts**

The original intent of the NSLP was to feed children who were deprived of food due to poverty, and to support America's farms. The needs of America's children have changed drastically, with larger servings available in restaurants and

increased calories available to children at every meal. The latest update of the NSLP, with a beginning implementation date during the 2012-13 school year, includes serving more fruits and vegetables, offering more whole grains, reducing the fat percentages in milk served, and limiting calories and serving sizes based on children's age (USDA News Release, 2012). School cafeterias are allowed three years for full implementation, with a projected cost of more than \$3 billion over five years. These changes were reportedly created in order to reverse the childhood obesity epidemic within one generation.

### **Options to Consider**

In order to provide meals that align with the Healthy, Hunger-Free Kids Act of 2010, and meet nutritional recommendations that include appropriate levels of vitamins, nutrients, fat, sodium, and calorie amounts, school districts must consider the following options:

Option #1 – Do nothing and continue to serve lunches that do not align with the current guidelines detailed in the Healthy, Hunger-Free kids Act of 2010 for another three years;

Option #2 – Mandate that all cafeterias within the school district follow the new nutritional guidelines within one year; and/or

Option #3 – Eliminate the second serving options for elementary children; and/or

Option #4 – Eliminate the unhealthy a la carte food items, such as chips, cookies, and ice cream and replace those choices with fresh fruit, water, and low sugar/calorie options.

School cafeteria menus have been limited, with regard to food choices, based on what commodities have been made available by the USDA each year. These limits have forced cafeterias to serve unhealthy foods to school children as a part of the NSLP, as well as to sell additional foods as a la carte choices in order to supplement their budget. These a la carte food items, as well as second servings, have provided additional funding to help cafeteria budgets break even; however, these extra food items are typically unhealthy and are potentially contributing to the childhood obesity epidemic.

If cafeterias do not change their practice, then the childhood obesity epidemic will not reverse. Therefore, school districts should consider implementing options #2, #3, and #4. By aligning with the nutritional guidelines within one year, as opposed to three, children will be provided with more appropriate portions and calorie amounts immediately, thus having more of an impact on the health of school children. Although this would be a costly endeavor, school districts could increase their lunch charge to align with the NSLP recommended \$2.78 per lunch. The increased revenue could help offset the cost increase required to implement the nutritional improvements. Eliminating second servings will insure that children receive the correct calorie amounts per lunch, instead of potentially doubling their fat and calorie intake when they receive two main entrées portions. The final option

allows for cafeterias to continue earning additional income to supplement their budget; however, the a la carte choices would reflect healthy food choices. Initially, those items might not sell at the same rate, but children would be provided with food options that reflect an appropriate diet and ultimately help reduce the childhood obesity epidemic.

### **Future Research**

This study investigated the degree to which children are purchasing second servings or a la carte food items. Little has been discussed in the research prior to this study; therefore, revealing this phenomenon was essential for initiating a conversation about the impact of additional calories on childhood obesity. For future research, however, the following recommendations could help further illuminate the sales rates of additional food sales to children who participate in the NSLP program.

Chapter II explored, in detail, the current levels of nutritional compliance and appropriate certification rates for children's eligibility to receive free and reduced lunches. There has been a great deal of research in both areas that resulted in very little change in NSLP operation. Gordon et al. (2007b) discovered that black and Hispanic students purchase lunches at significantly higher rates than white students. Li and Hooker (2010) found that children who purchase NSLP meals have a 4.5% higher chance of being obese. Turner and Chaloupka (2012) studies rates of extra food availability in U.S. cafeterias by region, and discovered that schools in the south have far more a la carte availability than schools in other regions of the U.S.

Therefore, future research could expand upon those studies and analyze purchase rates of a la carte and second servings made by black and Hispanic students in comparison to other ethnicities. This would be especially important based on prior research that revealed children from low socioeconomic (SES) households, and/or minorities are more likely to be obese and overweight (Ogden et al., 2010; Waters et al., 2008).

Schanzenbach (2008) assessed the calories eaten by children who purchase school lunches, in comparison to those who bring lunch each day. Children who buy NSLP lunch consume more calories. A future study could expand upon the lunch program and assess the calories purchased and consumed by children who buy second servings and/or a la carte food items in addition to the NSLP lunch. In addition, assessing the calories consumed at each meal would be an excellent way to determine if school cafeterias are following the new NSLP standard of 550-650 calories per lunch served, beginning in the 2012-13 school year.

Many cafeteria managers and administrators cite budgetary concerns as the primary reason why non-nutritious food items are served, and unhealthy a la carte and/or vending sales continue to be sold in school cafeterias (Cho and Nadow, 2004; Bartlett, Glantz, & Logan, 2008; Ralston et al., 2008). A closer analysis of cafeteria budgets would be an excellent area for future study. More data would certainly help guide policy, especially due to alternate reports of successful pilot programs that are able to not only sell healthy foods, but are able to stop selling a la carte items and make a profit (Christensen, 2010).

### **Limitations of the Study**

Study design limitations of this study were discussed in Chapter 3. As a reminder, this study represents only 11 elementary schools and approximately 5,000 students. The size of this sample population, and its location in the mid-Atlantic region limits the generalizability of this study. Further areas of concern could be related to the level of trust developed between the researcher and the five cafeteria managers when interviewed. In addition, the managers might have perceived this research project as a personal critique of the foods served by them in each of the cafeterias. The way this district reports food sales is also a limitation. Children who purchase extra food items are not monitored, and the items they do purchase are not tracked. For example, the type of milk or chips they buy is not recorded at the point of sale, so healthier choices made by children such as reduced fat milk or baked chips cannot be determined to plan for menu changes. A final concern would be the inability to prove causality between a la carte and second serving sales and the increase in childhood obesity. Although there were limitations to this study, that does not diminish the importance of the data revealed in this study, and the need for further research in larger geographic areas of the U.S.

### **Summary and Conclusion**

This case study revealed the purchasing rates of a la carte and second servings at the elementary level for one mid-sized school district. The reality was that elementary children purchased thousands of extra food items during lunch in October 2011, accounting for hundreds of additional calories for each of those



students. Extrapolating that data to estimate the potential number of items sold for an entire school year, as well as the calories those items represent, is worrisome considering the childhood obesity epidemic. Despite news reports and public service announcements made about the importance of eating healthy foods and exercising more, the childhood obesity epidemic continues to be a major area of concern, as does the food served in America's school cafeterias through the NSLP.


Childhood obesity is a topic that is in the midst of changing the way that many industries and government organizations operate. The combined conceptual frameworks detailed in Chapter 1 illustrate the importance of not only changing policy, but also changing the way that groups of people discuss and implement change. Without an open discussion between parents, teachers, cafeteria managers, administrators, and children about second servings and a la carte food items, in conjunction with true change by the USDA and the food industry, it is unlikely the childhood obesity epidemic will reverse within one generation.

## APPENDIX A. George Mason University HSRB Approval Letter



Office of Research Subject Protections  
Research Hall  
4400 University Drive, MS 6D5, Fairfax, Virginia 22030  
Phone: 703-993-4121; Fax: 703-993-9590

TO: Penelope Earley, College of Education and Human Development

FROM: Keith R. Bushey   
Chief of Staff, Office of Research

PROTOCOL NO.: 7961

PROPOSAL NO.: N/A

TITLE: The Implications of Second Servings and a La Carte Sales in the NSLP on  
Childhood Obesity

DATE: February 15, 2012

Cc: Amanda Wilder

Under George Mason University (GMU) procedures, this project was determined to be exempt by the Office of Research Subject Protections since it falls under DHHS Exempt Category 2, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

You may proceed with data collection. **Please note that all modifications in your protocol must be submitted to the Office of Research Subject Protections for review and approval prior to implementation.** Any unanticipated problems involving risks to participants or others, including problems regarding data confidentiality must be reported to the GMU Office of Research Subject Protections.

GMU is bound by the ethical principles and guidelines for the protection of human subjects in research contained in [The Belmont Report](#). Even though your data collection procedures are exempt from review by the GMU HSRB, GMU expects you to conduct your research according to the professional standards in your discipline and the ethical guidelines mandated by federal regulations.

Thank you for cooperating with the University by submitting this protocol for review. Please call me at 703/993-3088 if you have any questions.

**Permission for Participation in Research: Informed Consent**  
**Project Title: Second Serving and a La Carte Sales Interviews**

**RESEARCH PROCEDURES:** You have been selected to complete an interview about second servings or a la carte item sales during lunchtime at your school. This interview is a part of a research project being conducted by Amanda Wilder (Assistant Principal, Grace Miller Elementary School) as a part of a dissertation project to study food purchases in elementary school cafeterias. Dr. Penelope Earley, from the College of Education and Human Development at George Mason University, is supervising this project.

We will be conducting this research throughout the Winter and Spring of 2012, and will include anonymous lunch purchase data from computer reports, as well as these interviews. Each cafeteria manager will interview with Amanda Wilder at a time and in a place convenient to each participant. The questions asked will be related to food item sales during school lunchtime only. All answers by each participant will be kept confidential, and will not be shared with the school district.

The interviews will be audio recorded, and the audio recording device will be kept locked in a filing cabinet. Your name will be kept confidential at all times, and will not be included anywhere in the study documentation. Any information collected during this process, including electronic recordings and documentation, will be kept confidential by maintaining all materials in locked files, and password protected computers. All information related to this study will only be accessible to project staff, and viewed only by project staff. Once the information is collected, participant numbers/letters will be assigned, and any identifying information will be discarded. (Each interviewee participating will be listed as Manager A, B, C, etc.)

**RISKS:** There are no foreseeable risks for you participating in this research.

**BENEFITS:** There are no foreseeable benefits to you for participating in this study.

**CONFIDENTIALITY:** The data in this study will be confidential. The audio recording device that will record this interview will be kept in a locked filing cabinet, in the researcher's home office. All additional information collected will be identified only in terms of a coded identification number and all information reported will be combined data and therefore not identifiable to any individual person. At the end of the study, all data that was collected solely for the purposes of this study will be destroyed, including the audio recording.

**PARTICIPATION:** Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate in the interview process, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you.

**CONTACT:** This research is being conducted by Amanda Wilder, Assistant Principal at Grace Miller Elementary School, and supervised by Dr. Penelope Earley, from the College of Education and Human Development at George Mason University. They may be reached at (540) 439-1913 (Amanda), or (703) 993-3361 (Penny); for any questions or to report a research-related problem.

Revised 07/2005

1 of 2

**APPROVED**  
7961  
George Mason University

You may contact the George Mason University Office of Research Subject Protections at (703) 993-4121 if you have questions or comments regarding your rights as a participant in the research. This research has been reviewed according to George Mason University procedures governing your participation in this research.

**CONSENT:** I have read this form and agree to participate in this study.

**Introductory information:**

Participant Name \_\_\_\_\_

Years experience as a cafeteria manager: \_\_\_\_\_

Years experience at this school: \_\_\_\_\_

What training did you receive when you began this job?

**APPROVED**  
7961  
\_\_\_\_\_  
George Mason University

Version Date: 2/14/2012

## **APPENDIX B. Cafeteria Manager Interview Questions**

1. Could you please walk me through the lunch line and show me how students purchase extra items? (a la carte and second servings) and please show me where those items are in your sales line?  
[Complete this 4-7 days before the interview as rapport builder. Take photos of the lunch line without any persons or identifying features present in order to document where food items are placed.]

### **Second Meeting:**

2. Can you tell me about the a la carte options that are available for students to purchase each day?
3. Does any of your staff ask children if they want extras before they check out, or do the children have to ask? [deeper questioning if the answer is yes – could you tell me more about that process?]
4. Does the cafeteria have any special ways to promote sales of any food items? If so, what are they?
5. How do the second serving and a la carte sales impact your cafeteria budget?
6. Could you please describe how you order a la carte and entrée food items?
7. What type of sales goals do you have for this cafeteria? [probe for specifics]

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## **CURRICULUM VITAE**

Amanda J. Wilder graduated from Woodinville High School, Woodinville, Washington, in 1987. She received her Bachelor of Arts from the University of Washington in 1991, and her post-baccalaureate degree from James Madison University in 1992. She was employed as a teacher in Fairfax County for two years, in Prince William County for nine years, and received her Master of Education in Special Education from George Mason University in 1997.