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Gabrielle La'Dale Bryant

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AN EXAMINATION OF FAMILY NUTRITION PROGRAMS IMPLEMENTED BY
MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE IN JACKSON
PUBLIC SCHOOLS

By

Gabrielle La'Dale Bryant

A Thesis
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Master of Science
in Nutrition in the Department of
Food Science, Nutrition, and Health Promotion

Mississippi State, Mississippi

April 2011

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2011

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The Supplemental Nutrition Assistance Program-Education (SNAP-Ed) includes programs and educational curricula that promote healthy behaviors for people receiving nutrition assistance benefits, or eligible for benefits. This study investigated whether information given to children through SNAP-Ed nutrition education programs implemented in schools was taken home to educate parents. After programs were delivered to students by Mississippi State University Extension Service Nutrition Educators, parents ($N=302$, response rate=43.1%) of elementary students in eight public schools in Jackson, Mississippi, reported changes they made in their households. These changes included eating more fruits and vegetables or trying different fruits and vegetables, and being more physically active ($p<0.001$). A majority (63.9%) of parents reported that after their children participated in nutrition education programs, their children talked to them about healthy foods, and 73.2% reported their children asked for

more fruits, vegetables, milk, or yogurt. Teachers ($N=19$, response rate=38.0%) rated the SNAP-Ed education programs favorably.

DEDICATION

I would like to dedicate this research to a collection of special people in my life. I would first like to thank God in Heaven. God, I thank you for everything you have blessed me with knowingly and unknowingly. I would also like to thank God for my lovely parents, husband, beautiful daughter, and cats. Additionally, thank you for blessing me with a sound mind and the opportunity to be able to attend college and to pursue higher education.

Next, I would like to thank my lovely parents, Archie and Mary Bryant-Plump. Mom and Dad, I thank you for always wanting to see me with the best of things, even if it meant that each of you had to do without. Thank you especially, Mom, for always being honest with me, no matter what, and for continuing to give me advice, support, and encouragement any time of the day or night when I just needed to talk. They do not make moms like you anymore. Most of all I would like to thank you for always helping me to see the positive side of things when obstacles crossed my path and helping me to see that when God uses people or circumstances to close one door He will always open another.

I would also like to thank my father- and mother-in-law, Wali Aziz Sr. and Carolyn Aziz, for all of their support throughout my graduate studies. Momma Aziz, I especially want to thank you for always being positive and helping me to see the light at the end of my tunnel. Thanks for all of the talks and reassurances of when things do not

go according to my plans that God has a greater plan that may involve taking another pathway leading to where I need to be in life.

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CHAPTER I

INTRODUCTION

Obesity is becoming a more prominent contributing factor of death within the United States (U.S.) (Deckelbaum & Williams, 2001). Overweight and obesity touch the lives of nearly 97 million Americans (National Institutes of Health, 1998). According to Flegal et al. (2005), obesity claims the lives of approximately 112,000 Americans annually. From the 1960s to 1994, the percentage of people affected by obesity nearly doubled from 12.8% to 22.5% (National Institutes of Health, 1998). The National Health and Nutrition Examination Survey (NHANES) III indicated from 1988 to 1994 that 59.4% of men and 50.7% of women were overweight or obese (National Institutes of Health, 1998). Moreover, the prevalence of obesity is continuing to climb. From 1988 to the 2006, the number of people affected by obesity increased from 22.5% to 33.8% (Flegal et al., 2010; Ogden & Carroll, 2010a). The data from NHANES 2007–2008 study indicated that 35.5% of women and 32.2% of men were obese (Flegal et al., 2010; Ogden & Carroll, 2010a).

Obesity is a disease defined as having excessive adipose (fat) tissues to the extent that it adversely affects health. One of the most commonly used methods to estimate body fat is body mass index (BMI). BMI is a number calculated from an individual's weight (kg) divided by the square of their height (m²). Individuals who have a BMI

greater than or equal to 30.0 kg/m² are classified as obese, and those with a BMI greater than or equal to 25.0 kg/m² but less than 30.0 kg/m² are overweight (National Institutes of Health, 1998). With the number of individuals who are overweight and obese continuing to skyrocket, the healthcare system has faced the burden of increased cost of treating diseases related to obesity, such as diabetes, heart disease, and physical disabilities (Finkelstein et al., 2009; Finkelstein et al., 2003). According to Finkelstein et al. (2003), medical costs attributable to diseases related to being overweight and obese in the U.S. in 1998 were estimated at \$78.5 billion. Since 1998, these costs have risen enormously and by 2008 were estimated to be approximately \$147 billion (Finkelstein et al., 2009).

Some of the main factors causing obesity are social behaviors within ethnic populations (Centers for Disease Control and Prevention, 2009a) and increased caloric intake (energy input) with decreased physical activity levels (energy output) in relation to energy expenditure (amount of energy used) (Blom-Hoffman, 2008; Frazao et al., 2007a). These factors are viewed as placing individuals at an increased risk for other health conditions, such as hypertension, diabetes, cancer, stroke, or heart disease (Centers for Disease Control and Prevention, 2009a).

The prevalence of obesity not only affects adults, but also affects children (Deckelbaum & Williams, 2001). The NHANES 2007–2008 study reported that 19.0% of children ages 6 to 11 were obese (Ogden & Carroll, 2010b; Ogden et al., 2010). From 1976 to 2008, national data revealed a 13.1% rate increase in the percentage of obese children ages 6 to 11 (Ogden & Carroll, 2010b). According to Blom-Hoffman (2008), children in low-income families and from certain ethnic groups, such as African Americans and Hispanics, are at greater risk for becoming obese when compared to other

ethnic groups. According to data in the NHANES 2007–2008 study, in children the prevalence of obesity was highest among Mexican-American boys (26.9%) and non-Hispanic black girls (25.9%), followed by Mexican-American girls (19.7%), non-Hispanic black boys (18.9%), non-Hispanic white boys (18.2%), and non-Hispanic white girls (15.6%) (Ogden et al., 2010).

In children, obesity is defined as having a BMI on weight-for-length growth charts of greater than or equal to the 95th percentile. Similarly, overweight is defined as a BMI of greater than or equal to the 85th percentile but less than the 95th percentile (National Institutes of Health, 1998). Percentile measurements are used to determine the BMI of children by using a child's BMI, age, and gender. The percentile measurements show how a child's BMI compares with other children of the same age and gender (Centers for Disease Control and Prevention, 2009b). Since obesity in children has similar effects as those of adults, it places them at risk for adult diseases, such as hypertension and diabetes, and adverse health conditions such as hypercholesterolemia and physical impairments (Deckelbaum & Williams, 2001).

Obesity can have short- and long-term effects on the psychological well-being of children. Obese children are often isolated from their peers and targeted for teasing, which has an effect on their emotional well-being. Although some of these effects may begin as short-term, such as low self-esteem, emotional distress, and anxiety, they can transition into long-term effects such as chronic depression, suicide, and eating disorders (Texas Department of Health, 2004).

The Mississippi State Department of Health (2007) and Kolbo et al., (2006), stated that in Mississippi (MS) over 16.9% of children ages 6 to 11 were overweight or

obese. According to the NHANES 2003–2004 study, rates of overweight or obesity for children ages 6 to 11 in MS were highest for non-Hispanic black girls (25.4%), followed by non-Hispanic white boys (19.1%), non-Hispanic black boys (18.5%), Mexican-American boys (18.3%), non-Hispanic white girls (15.4%), and Mexican-American girls (14.1%) (Mississippi State Department of Health, 2007).

According to the Mississippi Department of Health (2007), the state of MS has collaborated with universities and organizations, such as the Mississippi State University Extension Service (MSU-ES), University of Southern Mississippi, and Healthy Jackson, to reduce childhood obesity through nutrition education. In MS, the Family Nutrition Program (FNP) is the name for the Supplemental Nutrition Assistance Program (SNAP). FNP provides nutrition education known as the Supplemental Nutrition Assistance Program-Education (SNAP-Ed) to low-income individuals and families participating in SNAP, or eligible for SNAP. The purpose of SNAP-Ed is to enhance the quality of life for individuals who are financially challenged (MSUcares, 2008). SNAP-Ed works to ensure that education provided to recipients is geared toward behaviors that will assist participants in making food choices that are healthier and more economical for their families (Guthrie et al., 2007a). Information provided by nutrition education programs offered through SNAP-Ed includes teaching family meal improvements, nutrition, and the use of MyPyramid (MSUcares, 2008). Educational programs within FNP/SNAP-Ed that are focused on children aged 6 to 11 years are Body Walk, Organ Wise Guys, and Show Me Nutrition.

The rise in obesity for those having low-incomes has caused SNAP to focus on promoting healthier behaviors (Frazao et al., 2007b). Diseases, such as diabetes,

hypertension, and cardiovascular disease, which result from food insecurities and unhealthy eating behaviors, have increased death rates. The resultant diseases affect households of every economic level, particularly the lower socioeconomic level (National Institutes of Health, 1998). Moreover, unhealthy eating behaviors are often passed down from generation to generation, which makes it difficult to break the cycle of inappropriate eating behaviors (Gorely et al., 2009; Rasmussen et al., 2006).

The purpose of this study was to examine the effectiveness of three FNP/SNAP-Ed programs: Body Walk, Organ Wise Guys, and Show Me Nutrition. It was a collaborative effort with the MSU-ES and public schools in MS, which had 50% or more of the students participating in the United States Department of Agriculture (USDA) free or reduced-price meal program. This study was implemented using parent and teacher surveys during the 2009–2010 academic year. Participants selected for the study were parents and teachers of kindergarten through sixth grade students. The objectives of the study were to: 1) determine whether nutrition education information given to children provided by MSU-ES Nutrition Educators was taken home to educate parents, 2) learn if nutritional or physical activity changes were made in the home after children participated in the programs, and 3) investigate teachers' awareness, perceived quality of the programs, and if they had made behavioral changes due to the nutrition information that was provided by the Nutrition Educators.

CHAPTER II

REVIEW OF LITERATURE

2.1 Overview of Obesity

Obesity is one of many risk factors for increased health disparities and deaths across the lifecycle (Deckelbaum & Williams, 2001). According to the National Institutes of Health (1998), overweight and obesity affected nearly 97 million adults in the U.S. with increasing prevalence among the adult population in the 1990s. The prevalence of obesity is expected to continue increasing in the 2000s (Flegal et al., 2010; Ogden & Carroll, 2010a).

Obesity has become a growing epidemic. From 1960 to 1994, there was a significant increase in the prevalence of obesity, 12.8% to 22.5%. In men, obesity increased from 10.4% to 19.9% and in women from 15.1% to 24.9% (National Institutes of Health, 1998). Furthermore, the National Institutes of Health (1998) stated that the prevalence of obesity was highest (66.0%) for non-Hispanic black women and Mexican-American men (63.9%). A comparison of the results from the NHANES III and the NHANES 2007–2008 studies showed the prevalence of obesity increased from 22.5% to 33.8% (Flegal et al., 2010; Ogden & Carroll, 2010a). The NHANES 2007–2008 data indicated that 32.2% of men and 35.5% of women were obese. The prevalence of obesity for men from 2007 to 2008 did not indicate significant differences between ethnic groups; however, the prevalence of obesity was highest for non-Hispanic black women

(49.6%), followed by Mexican-American women (45.1%), and non-Hispanic white women (33.0%) (Flegal et al., 2010; Ogden & Carroll, 2010a).

In the past four decades, the occurrence of obesity has risen from 13% to 31% (Ard et al., 2007). Concurrently, the occurrence of overweight has risen from 31% to 34% in the U.S. from the 1960s to the 2000s (Ard et al., 2007). In adults, the definition of obesity is having a BMI of 30.0 kg/m² or greater. The definition of overweight is having a BMI of 25.0 kg/m² to 29.9 kg /m² in adults (National Institutes of Health, 1998). Classifications for the BMI standards for adults were established by the National Institutes of Health (1998) and are presented in Table 2.1.

Table 2.1 Body Mass Index (BMI) Classification

Classification	BMI (kg/m²)
Underweight	18.4 or less
Normal	18.5 – 24.9
Overweight	25.0 – 29.9
Obesity – I	30.0 – 34.9
Obesity – II	35.0 – 39.9
Extreme Obesity – III	40.0 or greater

Source: National Institutes of Health, 1998.

Obesity can affect an individual's health in many ways. Categories of obesity risk factors are physical, social, and behavioral, or a combination of the three (Blom-Hoffman, 2008; Sturm, 2007). A specific risk factor that leads to obesity across the lifespan is low socioeconomic status (Frazao et al., 2007b). According to Guthrie et al. (2007b), obesity and other chronic diseases related to diet, such as cardiovascular disease, high blood pressure, and diabetes, are especially prevalent among lower socioeconomic populations.

From 1970 to 2004, the consumption of food increased tremendously. Data from the Economic Research Service (ERS) revealed that the amount of energy consumed daily in America per individual increased by more than 500 kilocalories (Mancino & Andrews, 2007). Other diet-related factors leading to diseases, such as obesity, diabetes, and cardiovascular disease, include under-consumption of whole grains, oversized food portions, and the wide availability of fast foods (Blom-Hoffman, 2008; Frazao et al., 2007a).

Over the past 20 years, portion sizes have increased and this has been suggested as a contributing factor in the rise in chronic diseases related to diet (Mancino & Andrews, 2007). Individuals are prone to consume more food per sitting when faced with larger portions (Blom-Hoffman, 2008; Mancino & Andrews, 2007). ERS data have shown that meals eaten outside the home do not include one serving of fruit on a daily basis. Furthermore, vegetables eaten outside the home are not equivalent to one and a quarter servings on a daily basis (Frazao et al., 2007b). According to Lorson et al. (2009), the most common vegetable consumed by Americans is the potato, which is typically

consumed in the form of French fries. Lorson et al. (2009) also stated that French fries account for over 28% of vegetable consumption.

Most Americans at all economic levels, particularly the lower socioeconomic level, are eating saturated fats, sodium, and sugars in excess (Blom-Hoffman, 2008; Frazao et al., 2007a; Guthrie et al., 2007b). They have decreased physical activity levels in relation to energy expenditure (Blom-Hoffman, 2008; Frazao et al., 2007a). Moreover, they are not consuming enough fruits, vegetables, and dairy products (Frazao et al., 2007a; Guthrie et al., 2007b). The ERS reported that nearly 19% of low-income households purchased no fruits and vegetables during any known week in comparison with households of higher income. In 2004 and 2005, a low-income household of four typically spent \$54 monthly on fruits and vegetables, which was \$17 less than a household of four with a higher income (Guthrie et al., 2007a). Concurrently, in 2004 and 2005 a study by the Consumer Expenditure Survey revealed that average monthly spending in the lowest socioeconomic bracket was \$51 for fruits and vegetables, \$57 for families in the \$50,000–\$69,000 bracket, and \$76 for families in the socioeconomic bracket above \$70,000 (Frazao et al., 2007b).

2.2 **Childhood Obesity**

The number of obese adolescents and adults has increased two-fold over the past 30 years worldwide (Deckelbaum & Williams, 2001). Co-morbidities associated with obesity, such as diabetes and hypertension, have nearly the same effects on children as adults. Devastatingly, obesity in adolescents is often carried over into adulthood. Additionally, health disparities and mortality were higher for adults that were overweight

during their adolescent years, even when weight loss was achieved in adulthood (Deckelbaum & Williams, 2001).

Fruit and vegetable consumption within the adolescent population has declined and has been below the recommended levels (Lorson et al., 2009). Prevention and intervention are the key efforts used to promote the consumption of fruits and vegetables according to daily recommended guidelines in MyPyramid, especially among children living in poor environments (Blom-Hoffman, 2008). A step-by-step description of the key concepts of the MyPyramid for Kids is presented in Figure 2.1 (United States Department of Agriculture, 2005).

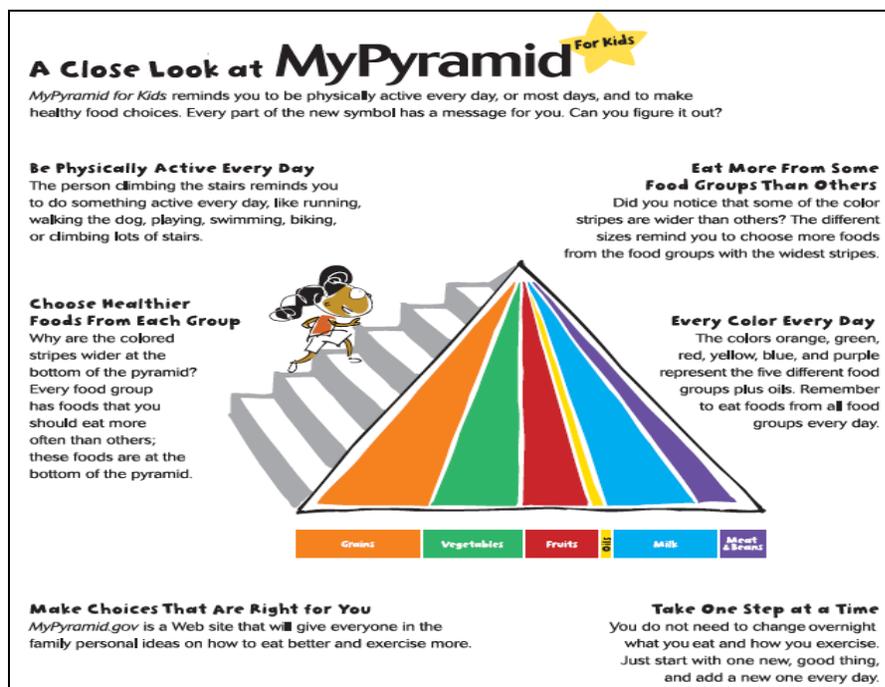


Figure 2.1 MyPyramid for Kids

Source: United States Department of Agriculture, 2005.

According to Deckelbaum and Williams (2001), statistics between the NHANES I and NHANES III studies showed an increased prevalence of obesity in the U.S. among children. There has been an increased prevalence of obesity among every ethnic group, with some groups being affected more than others. Obesity rates were the highest for Mexican American boys and girls, followed by black and white American boys and girls (Deckelbaum & Williams, 2001). Ogden and Carroll (2010b) and Ogden et al. (2010) noted that the NHANES 2007–2008 data revealed 19.0% of children ages 6 to 11 were obese. Comparing the NHANES II and the NHANES 2007–2008 studies revealed an increase in the prevalence of obesity from 6.5% to 19.0% in children 6 to 11 years (Ogden & Carroll, 2010b). Rates of obesity were highest in boys for Mexican-American boys (26.9%), followed by non-Hispanic black boys (18.9%), and non-Hispanic white boys (18.2%). Concurrently, rates of obesity were highest in girls for non-Hispanic black girls (25.9%), followed by Mexican-American girls (19.7%), and non-Hispanic white girls (15.6%) (Ogden et al., 2010). Moreover, incidences of children having chronic diseases have occurred due to increasing rates of obesity. For example, four percent of children diagnosed with diabetes before 1992 had Type II diabetes (Deckelbaum & Williams, 2001). By 1994, there was a four-fold increase in newly diagnosed children with Type II diabetes (Deckelbaum & Williams, 2001).

It has been suggested that consuming adequate amounts of fruits and a variety of vegetables, such as leafy green, orange, and yellow vegetables, could promote good health and deflect long-term diseases, such as obesity (Lorson et al., 2009). In the 1990s, the national 5-A-Day Campaign promoted the consumption of fruits and vegetables in public and private school programs (Blom-Hoffman, 2008; Domel et al., 1996). More

recently, the Child Nutrition and WIC Reauthorization Act of 2004 developed a federal mandate, which required public and private sectors participating in food service programs provided by the federal government to create a wellness policy by the beginning of the 2006–2007 academic year. This wellness policy must provide guidelines for physical activity, nutrition education, and foods served within each school (Blom-Hoffman, 2008).

2.3 The Food Stamp Program and Supplemental Nutrition Assistance Program

The Food Stamp Program (FSP) began as a pilot program from 1961 to 1964 (Food and Nutrition Service, 2009a). The FSP became a permanent program through the Food Stamp Act of 1964 with approximately 380,000 participants and increased participation from eight to 43 regions in 22 states. The intent of the Food Stamp Act of 1964 was to: 1) bring the FSP into a law, 2) make the agricultural economy stronger, and 3) improve nutrition for low-income households (Food and Nutrition Service, 2009a).

In 2008, the FSP officially changed its federal name to SNAP by authorization of the Food, Conservation, and Energy Act of 2008 (Food and Nutrition Service, 2009b). However, SNAP within each state may be referred to by another name. The name change was inspired by the changes SNAP made to meet the needs of the participants. These changes included concentrating more on nutrition and increasing the funds that participants received in minimum monthly benefits, which increased from \$10 to \$14 (Food and Nutrition Service, 2009b; Food and Nutrition Service, 2009c).

SNAP is regulated by the Food and Nutrition Service (FNS) of the USDA. The purpose of FNS is to give families in need a method to gain access to food and a healthy diet. The FNS works with all states and each state is responsible for many of the organizational aspects regarding eligibility requirements and allocation of SNAP benefits

to the participants. The FNS provides funding for each state's organizational costs. Interestingly, most food and nutrition programs, such as the National School Lunch Program, the Needy Family Program, and SNAP existed as independent entities before the FNS was developed in 1969 (Food and Nutrition Service, 2010a).

2.4 Determination of SNAP Income

Helping over 26 million Americans to purchase food using SNAP benefits has improved food security and economic welfare for low-income families (Guthrie et al., 2007b). The amount of SNAP funds provided to participants is based on average national prices. Funds allotted by SNAP are determined by the Thrifty Food Plan, which is an arrangement of meal strategies that can provide healthy meals at low cost. On average, the amount of most funds allotted by SNAP is approximately 28% of the poverty line. For low-income households, the national average cost for an "adequate amount of food" is approximately 10% less than the maximum amount of food stamp funds allotted by SNAP (Nord & Hopwood, 2007). The national average cost of an "adequate amount of food" in a particular area is determined by the average amount of money that low- and medium-income households report spending to cover the cost of food and is adjusted for each household size and income (Nord & Hopwood, 2007). Since the 1970s, the number of Americans receiving assistance and the annual cost of funds allotted by SNAP has increased each year (Food and Nutrition Service, 2010b). FNS administration records in 2008 revealed that over 28 million Americans received monthly SNAP benefits, which totaled over \$34 billion for the fiscal year (Wolkwitz & Trippe, 2009).

Table 2.2 presents the gross (a household's total income before deductions) and net (income after deductions) monthly income requirements from October 2009 to

September 2010 for the U.S. (excluding Alaska and Hawaii), Guam, and the Virgin Islands (Food and Nutrition Service, 2010b; Food and Nutrition Service, 2009d). The size of the household is considered when determining poverty income guidelines.

Table 2.2 Maximum Gross and Net Monthly Income Guidelines to Determine Federal Assistance

Household Size	Gross Monthly Income (130% of poverty)	Net Monthly Income (100% of poverty)
1	\$1,174.00	\$903.00
2	\$1,579.00	\$1,215.00
3	\$1,984.00	\$1,526.00
4	\$2,389.00	\$1,838.00
5	\$2,794.00	\$2,150.00
6	\$3,200.00	\$2,461.00
7	\$3,605.00	\$2,773.00
8	\$4,010.00	\$3,085.00
Each additional member	+\$406.00	+\$312.00

Source: Food and Nutrition Service, 2010b.

Incomes in Table 2.3 are based on households that meet both the gross and net income requirements of SNAP. However, households with elderly or disabled persons that are being compensated only have to meet the net income requirement of SNAP. Moreover, households where every person within the house is using Temporary Assistance for Needy Families (TANF), Supplemental Security Income, or some type of general assistance are not required to meet SNAP income requirements (Food and Nutrition Service, 2009d).

The benefits or the amount of funds allowed for each household is determined by taking each household's monthly net funds and multiplying by 0.3. The remainder is

subtracted from the maximum amount allowed for each household size (Food and Nutrition Service, 2009d). Table 2.3 shows the maximum amount of funds allowed for each household in the U.S. from October 2009 to September 2010.

Table 2.3 Maximum Monthly Benefits Provided by the Supplemental Nutritional Assistance Program per Household

Household Size	Maximum Monthly Benefits
1	\$200.00
2	\$367.00
3	\$526.00
4	\$668.00
5	\$793.00
6	\$952.00
7	\$1,052.00
8	\$1,202.00
Each additional member	\$150.00

Source: Food and Nutrition Service, 2010b.

Benefits provided by SNAP are dispensed through an electronic debit card, known as an Electronic Benefit Transfer (EBT) card (Guthrie et al., 2007a). Each recipient receives benefits transferred monthly to a federal account with approved funds to assist with the food needs of the household (Food and Nutrition Service, 2009a). SNAP recipients have the freedom to purchase foods, such as breads, cereals, meats, fruits, vegetables, dairy products, seeds and plants that produce food, and beverages with food labels, as they wish by transferring funds from a Federal account to a retailer account using an EBT card (Food and Nutrition Service, 2010b; Guthrie et al., 2007a). EBT is used in all States, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. Excluded from the list of eligible foods are items that are prepared and sold hot,

alcoholic beverages, pet foods, vitamins and medicines, foods made for in-store eating, and non-food items, such as household supplies (Food and Nutrition Service, 2010b).

2.5 Supplemental Nutrition Assistance Program-Education

The SNAP-Ed, formally known as Food Stamp Nutrition Education, started in 1988 and was designed to provide scientific, behavior-based nutrition education to participants in the FSP (Cooperative State Research, Education, and Extension Service, 2009). Throughout the U.S., there are millions of participants of all ages with low-incomes (Guthrie et al., 2007a). Low-income is defined as income between 100% and 199% of the poverty threshold (Wallman, 2010). The poverty threshold is defined as the least amount of income that is needed by a family or individual that satisfies nearly 100% of the nutritional requirements and other necessities (National Institutes of Statistics of Rwanda, 2010). The poverty threshold is updated annually by the U.S. Census Bureau (United States Department of Health and Human Services, 2010).

In order for SNAP-Ed to function, offices that distribute SNAP benefits within each state work with one or more agencies that participate in SNAP-Ed. SNAP-Ed agencies administer different types of educational activities. These activities include group classes for low-income adults, cooking demonstrations, school activities for children, and media advertisements with public service announcements targeting low-income viewers (Guthrie et al., 2007a). Annual federal spending for SNAP-Ed ranged from \$661,076 to over \$247 million from 1992 to 2006, respectively, which is equivalent to less than \$20 per person in federal and state finances for educational programs (Guthrie et al., 2007a; Guthrie et al., 2007b). In addition, from 1992 to 2006, involvement

in SNAP-Ed increased from seven to 50 states, the District of Columbia, and the territories of Guam and the Virgin Islands (Guthrie et al., 2007a).

The USDA sponsors SNAP-Ed along with states that elect to participate (Guthrie et al., 2007a). In MS, SNAP-Ed is known as the FNP. The purpose of the FNP in MS is to enhance the quality of life for individuals who are financially challenged. The FNP reaches financially challenged individuals participating in SNAP, or those who are eligible for SNAP benefits, through nutrition education programs, which provide education to participants about family meal improvements, nutrition, the use of MyPyramid, food purchasing techniques, and food safety. The FNP is also responsible for recognizing populations in need and delivering nutrition information materials to those populations (MSUcares, 2008).

State agencies that opt to administer nutrition education through SNAP qualify for a refund of nearly half of their SNAP-Ed expenses from the USDA's FNS (Cooperative State Research, Education, and Extension Service, 2009). SNAP participants are reached through state and local partners, as well as other affiliates of SNAP-Ed. For example, more than half of SNAP-Ed programs are operated by a Cooperative Extension Service at land grant universities (Cooperative State Research, Education, and Extension Service, 2009; Guthrie & Variyam, 2007). In MS, SNAP-Ed is operated through the MSU-ES.

2.6 Programs Offered By Mississippi State University-Extension Service

The MSU-ES and public schools with 50% or more of students receiving free or reduced-price meals in the school lunch program are working together to teach children how to be healthy in an attempt to reduce the soaring rates of overweight and obesity in children and adolescents. Through prevention and intervention, the following programs

may help reduce the occurrence of chronic diseases, such as obesity, diabetes, hypertension, and cardiovascular disease.

2.6.1 *Body Walk*

The Body Walk program in MS is an education program developed to teach elementary students about health and the importance of physical activity and making healthy nutrition choices (MSUcares, 2009a). Body Walk is offered through MSU-ES during the school year. There is no charge for schools or students to participate in Body Walk. It was developed for kindergarten through fifth grade students (MSUcares, 2009b). Educational activities offered through the program allow children to learn skills needed for making healthy nutrition choices and living a healthy lifestyle (MSUcares, 2009a).

The main activity, which Body Walk promotes, is a 40-foot long and 40-foot wide exhibit that represents the human body. Students are prepared for the exhibit by classroom activities before and after the tour. Moreover, educational materials are provided for each student in the form of activity books that the students can take home. Other resources are made available based on nutrition education, along with a school health kit, information sheets for parents, and other resources to publicize the event and communicate through the media (MSUcares, 2009a). According to MSUcares (2009c), Body Walk was designed because there is an urgent need to focus on proper nutrition in addition to other healthy lifestyle behaviors among school-age children. Less than 15% of school-aged children are eating the recommended amounts of fruits and less than 20% are consuming the recommended amounts of vegetables (MSUcares, 2009a). Only 25% are eating the recommended amounts of grains, and 30% are not consuming the recommended amounts of milk and dairy products (MSUcares, 2009a). Approximately

two-thirds of children in school-age populations consume more fat (saturated and trans fats) than is recommended (MSUcares, 2009a).

According to Blom-Hoffman (2008), Domel et al. (1996), and MSUcares (2009c), lifestyle-based decisions, such as the consumption of fruits and vegetables, made early in life can have a direct impact on health into adulthood. Prevention through education is the key to preventing health disparities from developing later in adulthood. Through the Body Walk program, children learn about the importance of healthy lifestyles and how to avoid behaviors that will affect their health in their adult life. The children will also learn how to prevent health problems, such as obesity in children, from developing (MSUcares, 2009c). Obesity in children is often carried over into adulthood and is a risk factor for the development of many chronic conditions, including cardiovascular diseases, hypertension, and diabetes (Blom-Hoffman, 2008; MSUcares, 2009c).

2.6.2 *Organ Wise Guys*

The MSU-ES is helping with the promotion of Organ Wise Guys, which uses the Organ Wise Guys curriculum to direct attention to nutrition and physical activity. Organ Wise Guys is one of two curricula that is part of the Delta Healthy Options for People through Extension (HOPE) program. It teaches children how to eat healthy to prevent obesity. The program was organized with SNAP sponsoring organizations in the Delta areas of Mississippi, Louisiana, and Arkansas to help teachers integrate nutrition and physical activity in the classroom, to prevent obesity, and to promote healthy lifestyles among school-age children (Breazeale, 2005).

Delta HOPE is funded by a W. K. Kellogg Foundation grant. The program provides education and assessments in Delta regions by Extension agents from the three

Delta states. The program works by combining two curricula, Take 10! and Organ Wise Guys, to concentrate on physical activity and nutrition. The curriculum, which integrates 10 minutes of exercise three times a week, helps students stay on task and focus on activities in the classroom (Breazeale, 2005).

Little Organ Annie dolls were created for young children to teach them that everyone's body is similar on the inside. Additionally, the Little Organ Annie dolls were designed to open, revealing the Organ Wise Guys. Organ Wise Guys is a team of ten characters used to teach basic human physiology as the human body responds to food and different lifestyles. They provide health education in an exciting manner for ages three to eight years, first through fifth grades, and adolescents through senior adults (Breazeale, 2005).

The team of ten Organ Wise Guys represents ten body parts in the human body. These body part characters help children learn that eating foods low in fat and high in fiber, drinking plenty of water, and physical activity are important rules for healthy living. The ten body part characters are described as: 1) the intestines, named Peri Stolic, 2) Hardy Heart (representing the human heart), 3) the Kidney Brothers, 4) Madame Muscle, 5) Windy (the lungs), 6) Luigi Liver, 7) Peter Pancreas, 8) Calci M. Bone (the bones within the body), 9) Sir Rebrum (representing the brain), and 10) Pepto the stomach. The colorful characters are excellent tools for communicating health issues, inspiring changes in behavior, and ideal for motivating the education process (Breazeale, 2005).

2.6.3 *Show Me Nutrition*

The Show Me Nutrition program is also promoted by MSU-ES. The University of Missouri Extension developed the Show Me Nutrition curriculum (University of Missouri Extension, 2006a). The University of Missouri Extension is associated with extension programs at over 70 universities worldwide (University of Missouri Extension, 2006b). This comprehensive program has nutrition curricula that teach children from pre-school through junior high school about healthy lifestyles. Each grade has a curriculum in agreement with Missouri's Show Me educational standards. These standards were adopted from the National Health Standards. Examples of themes that occur in each grade are nutrition, food safety, physical activity, peer pressure, and body imaging (University of Missouri Extension, 2006a).

Each Show Me Nutrition lesson provides two to three core activities, two to three supplemental activities, and newsletters to reiterate the lesson. The lessons are age-appropriate and are about 30 to 45 minutes in length (University of Missouri Extension, 2006a). The objective of each lesson is to provide education based on behavior changes including increasing physical activity. Moreover, lessons are classroom connected. Each lesson provides handouts, visual aids, websites, recipes, and other enrichment activities. The curriculum was designed to make each lesson easy for teachers to use by giving them instructor tips for each activity and background information that can be reviewed before each lesson (Willenberg, 2006).

2.7 **Other Nutrition Education Programs**

Guthrie and Variyam (2007) noted that individuals tend to change their food selection as a result of scientific data when diet and health are linked. It is also evident

according to research that when information is promoted concerning fats and cholesterol, it results in a rise in consumption of fruits and vegetables and a decline in meat, egg, fat, and oil consumption. Moreover, people who receive more nutrition facts tend to make more nutritious food decisions. Unfortunately, research data do not provide evidence that nutrition education offered to consumers participating in SNAP, or eligible for SNAP, is likely to cause them to alter their diet regimen (Guthrie & Variyam, 2007). Factors that contribute to spending patterns in low-income homes are taste preferences, availability, selection, pleasure, or affordability when it comes to deciding which foods to consume (Frazao et al., 2007b; Guthrie & Variyam, 2007; Lin & Guthrie, 2007).

Results from the Smart Bodies school wellness program have shown positive changes in fourth and fifth graders' nutrition knowledge and self-confidence for fruit and vegetable consumption. Smart Bodies is a program supported by Blue Cross and Blue Shield of Louisiana Foundation. The program is conducted by the Louisiana State University Agricultural Center and is composed of three intervention parts for children in kindergarten to fifth grade. It is designed to teach children in low-income schools of southeast Louisiana why healthy bodies and active minds are important (Tuuri et al., 2009). According to Tuuri et al. (2009), older children have a liking for additional foods and are more likely to try new foods, but are still likely to not favor and dismiss new foods after introduction.

An evaluation of the Mississippi Department of Education Child Nutrition Program revealed that during the 2004–2005 academic year, eighth and tenth graders had a better success rate than fifth graders with respect to trying new fruits and vegetables, during a fresh fruit and vegetable pilot program in MS (Centers for Disease Control and

Prevention, 2006). The program, as noted by the Centers for Disease Control and Prevention (2006), was developed to increase availability, degree of preference, and consumption of fruits and vegetables among fifth, eighth, and tenth graders at 25 schools. Fruits, vegetables, and nutrition education were provided free of charge to encourage more fruit and vegetable intake. The survey data from the program were evaluated by using pre- and post-tests over the course of the academic year. The results revealed an increase in a range of fruits and vegetables among all students, an increase in fruit and vegetable preferences among eighth and tenth graders, and an increase in consumption of fruits within the eighth and tenth grade populations. Moreover, findings from the evaluation indicated that schools provided with free fruits and vegetables may be effective in the overall approach for improving dietary habits among school children (Centers for Disease Control and Prevention, 2006).

Children are prone to like fruits because of the sweet taste, and it is likely for them to not favor vegetables; although, the liking of vegetables tends to increase as children get older (Blom-Hoffman, 2008; Tuuri et al., 2009). A method to increase the liking for foods not favored among children and adolescents is to increase their awareness through multiple introductions (Blom-Hoffman, 2008). The reason for negative outcomes in fruit and vegetable consumption in children may be due to their parental figures in terms of food; therefore, targeting children by themselves is more than likely inadequate in order to make change possible (Gorely et al., 2009).

Research suggests that food preferences tend to change during adolescence. Early food selections play an important role during this time because they are carried over into adulthood. It is important for children to develop their own taste preference for fruits and

vegetables in their early years (Centers for Disease Control and Prevention, 2006). Research has indicated that repeated exposure (eight to ten different occasions) of eating various foods can lead to an increase in taste preferences (Tuuri et al., 2009). Additionally, children are more likely to develop taste preferences if parents participate in tasting sessions to encourage and promote new foods during mealtime (Tuuri et al., 2009). Another key factor in enhancing food preference and molding healthy lifestyle behaviors is the school environment. According to Tuuri et al. (2009), 40 million or more students ranging from pre-kindergarten to eighth grade were expected to be enrolled in school for the 2008–2009 academic term.

Schools can be ideal environments to encourage children to accept and like fruits and vegetables (Tuuri et al., 2009). For example, the Athletes in Service (AIS) fruit and vegetable program in Boston, Massachusetts, was evaluated in elementary schools for children in kindergarten to third grade to promote fruit and vegetable consumption. This program combines physical activity and fruit and vegetable promotion efforts to increase children's nutrition information and to improve fruit and vegetable preference, eating behavior, weight status, and the availability of fruits and vegetables within the home. AIS is based on the Sports4Kids curriculum. It was developed to work with physical education (PE) teachers in schools during PE class time (Blom-Hoffman, 2008). In 2005, improvements were made to the program by integrating fruit and vegetable promotion components. The components of the program included activities that involved the entire school, classroom, lunchroom, and family (Blom-Hoffman, 2008). Results after the first year of the multi-year primary evaluation, according to Blom-Hoffman (2008), indicated that the program was highly acceptable. It was also reported that the children tended to

eat the fruits and vegetables before other foods during lunchtime. These findings supported the effectiveness of behavior change strategies that were designed to promote fruit and vegetable consumption during lunchtime. Additionally, according to Blom-Hoffman (2008), the teachers reported that since the program had been implemented in the school, it increased their awareness of nutrition and their fruit and vegetable consumption.

In summary, obesity is a contributing factor of death within the U.S. Furthermore, the prevalence of obesity affects children the same as adults (Deckelbaum & Williams, 2001). For example, children that are overweight and obese are at risk for adult diseases, such as hypertension and diabetes. National data, according to Ogden & Carroll (2010b), revealed that 19.6% of children in the U.S. were obese. SNAP-Ed works to ensure that education provided to recipients is geared toward helping participants to make healthy and economical food choices for their families (Guthrie et al., 2007a). In this study, the MSU-ES and public schools are working together to teach children how to be healthy in an attempt to reduce the rates of overweight and obesity in children 6 to 11 years of age. After examining the research findings, the researcher hopes to learn that: 1) information given to the children provided by the Nutrition Educators was taken home to educate the parents, 2) physical activity and nutrition changes were made in the home after the children participated in the nutrition programs, 3) teachers have a positive perception of the quality of the nutrition programs, and 4) teachers made behavioral changes due to the nutrition information. In addition, the researcher hopes to provide information that can be beneficial for the FNP and the MSU-ES.

CHAPTER III

MATERIALS AND METHODS

The MSU-ES and Jackson Public Schools worked together with the FNP to provide nutrition education to children. Areas in which the FNP focused on were teaching nutrition principles, for example, how to use MyPyramid and food safety practices to improve health and prevent illness (MSUcares, 2008). Jackson Public Schools were selected for this study because over 50% of the student population participated in the USDA free or reduced-price meal program. In addition, the schools were also currently using curricula and educational materials from the FNP. The programs were provided to the schools by MSU-ES Nutrition Educators.

This project examined the effectiveness of three FNP/SNAP-Ed programs: Body Walk, Organ Wise Guys, and Show Me Nutrition, through a survey completed by the parents of students who attended kindergarten through fifth grade. There was also a survey for the teachers (kindergarten to fifth grades). The primary focus of the study was fourth and fifth grades.

An email was sent to MSU-ES Nutrition Educators asking if they wanted to help in examining nutrition education being provided to elementary schools. Nutrition Educators in the Jackson, MS, area responded that they would like to assist in the examination. School principals where ongoing FNP curricula were being conducted were

asked if they wished to participate. Eight principals representing eight schools in Jackson, MS, volunteered to participate and wrote letters of collaboration for the project.

3.1 Survey Design and Data Collection

A survey was developed based on a previous survey that was conducted in 2006 by MSU-ES professors. The survey questions were modified and sent to several social science researchers for review. The researchers had knowledge and experience in survey research. After modifications were made based on comments by the reviewers, the surveys in Appendices A and B were used for the study. The surveys included one questionnaire for the parents and one for the teachers of elementary students. Teachers also signed a letter of informed consent prior to participating in the study (Appendix C).

The questionnaire for the parents (Appendix A) contained 13 questions and included questions such as, “Have you made any changes in your family’s eating and/or been more physically active as a result of what your child has learned?” and “If you have not made any changes in your family practices as a result of what your child has learned at school, please tell us why. (Check all that apply).” These questions were used to determine if the nutrition education and/or physical activity information taught in the classroom was taken home, and whether the information had an impact at home regarding nutrition and physical activity practices.

The survey for the teachers (Appendix B) contained nine questions and included three open-ended questions: 1) “Do you have any requests, comments, or suggestions for improving the program(s)?”, 2) “Do you think there are any areas in nutrition, food, or health that should be taught that are currently not being taught?”, and 3) “Do you have any other comments or suggestions about programs provided by the Mississippi State

University Extension Service?” These questions, and other questions, were used to determine the degree of satisfaction with the educational programs provided by the FNP.

The surveys, letters, and informed consent forms were copied at MSU and were sent to a MSU-ES Nutrition Educator in Jackson, MS, who volunteered to deliver the surveys and materials to the teachers in the schools. Teachers sent the parent surveys home with each student, along with an attached one-page letter (Appendix D). The letter informed parents that if they chose to participate and complete the survey, it would help MSU-ES plan future programs about eating healthy and active living. Additionally, the letter explained that participation in the survey was confidential and voluntary. Participating, or not participating, in the survey would not affect their child in any way.

Parents were asked to return surveys to the school by the end of January 2010. On approximately the 15th day of January 2010, a reminder letter (Appendix D) was sent home with each student asking parents who had not done so to return the survey. When the students returned the completed surveys, the teachers had the students place them into a large envelope in their classrooms. The teachers also returned their surveys in an envelope in order to preserve anonymity. In the beginning of February 2010, the teachers sealed the large envelopes and the MSU-ES Nutrition Educator collected the envelopes from the schools. The sealed envelopes were returned to the researcher at MSU.

3.2 Inducement

The inducement offered in this study was a prize to the teacher/classroom returning the most parent surveys. The prize was an educational resource for the teacher to use in the classroom, for example, a MyPyramid poster.

3.3 Institutional Review Board Approval

This study received Institutional Review Board approval through the MSU Regulatory Compliance Office in May 2009. Approval was granted prior to beginning the study. Appendix E contains the Institutional Review Board letter of approval.

3.4 Data Analysis

The Statistical Package for Social Sciences (SPSS Version 18.0, S PSS Inc., Chicago, IL) was used for all data analyses. Descriptive statistics were reported for awareness of the nutrition programs, fruit and vegetable intakes, level of physical activity, and changes made in the household. Results are reported as frequencies for categorical data and means \pm standard deviations (SD) for continuous data. Chi-square tests were utilized to determine changes in the households reported by parents as a result of their children participating in nutrition education programs. An alpha level of 0.05 was used to determine significance.

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Parent Survey Results

For the 2009–2010 academic school year, 700 parent surveys were sent to eight public schools in Jackson, MS, and the response rate was 43.1% ($N=302$). Parents reported their children were in the following grades: 40.8% ($n=122$) in fourth grade, 28.4% ($n=85$) in third grade, 24.7% ($n=74$) in fifth grade, 2.3% ($n=7$) in kindergarten, 2.3% ($n=7$) in first grade, and 1.3% ($n=4$) were in the second grade. Three parents (0.2%) did not provide responses for their children's grades (Figure 4.1). The most frequent government assistance program that parents reported participating in was the Child Nutrition Program (free or reduced-price school meals), with 46.4% participation (Figure 4.2). Participation in other government assistance programs from the parent surveys revealed that 35.4% participated in SNAP, 27.5% participated in WIC, 22.8% participated in TANF, 13.2% participated in Head Start, and 16.6% of the parents reported that they did not participate in any of the government assistance programs (Figure 4.2).

Ethnicity demographics for the participants indicated that most (86.4%, $n=261$) were Black (non-Hispanic). Other ethnicities reported included seven parents (2.3%) who checked both Black (non-Hispanic) and American Indian or Alaskan Native categories, 1.3% ($n=4$) indicated Black and Hispanic/Latino, other respondents (2.0%, $n=6$) checked

several ethnicity categories, and 7.9% ($n=24$) did not reply. Blom-Hoffman (2008) reported that African American, American Indian, and Hispanic elementary school-age children in the lower socioeconomic level participating in programs, such as the Child Nutrition Program and the School Breakfast Program, have a greater risk of becoming overweight than other races.

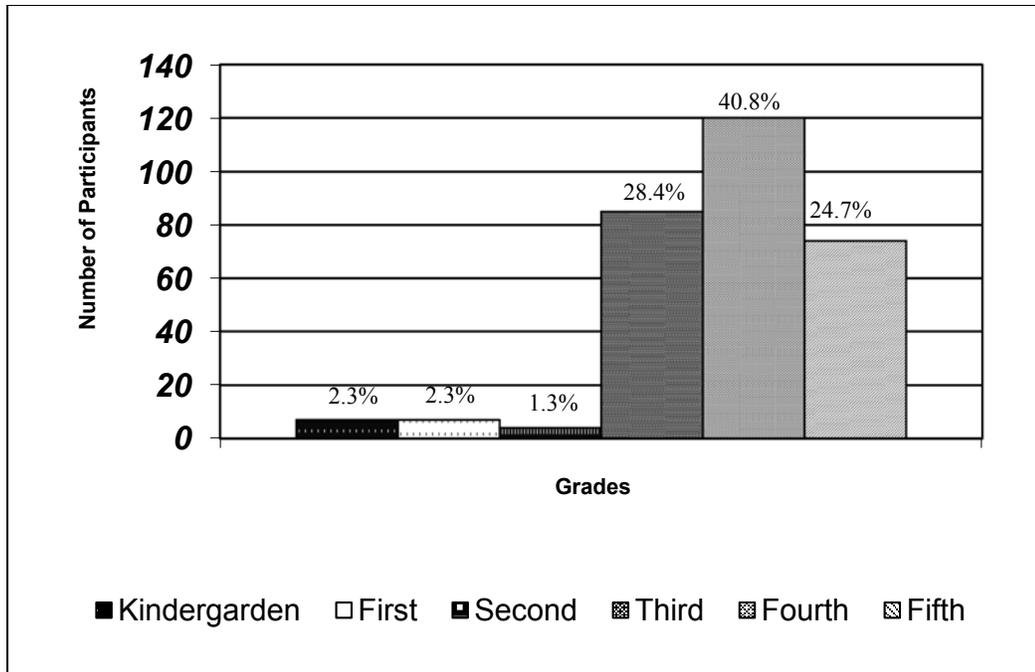


Figure 4.2 School Grades of Children as Reported by Parents

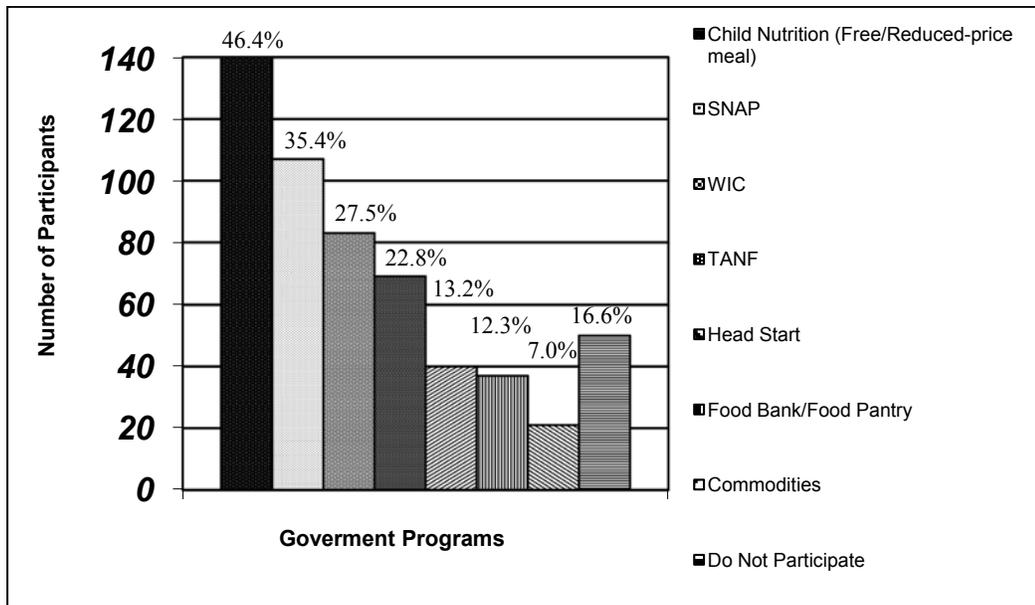


Figure 4.3 Participation in Government Programs as Reported by Parents

On the survey, parents were asked if their child had told them about the nutrition education programs. It was revealed that 41.4% ($n=125$) of the parents reported their child had not told them about one or more of the programs, 35.8% ($n=108$) reported being told about Show Me Nutrition, 18.2% ($n=55$) reported being told about Organ Wise Guys, and 17.5% ($n=53$) reported being told about Body Walk. The parent surveys indicated that since participating in nutritional education programs, 72.2% ($n=218$) of children asked for more fruits, vegetables, milk, or yogurt, 63.96% ($n=193$) of children talked about being more active, and 62.6% ($n=189$) of children talked about healthy food and/or snacks.

The majority (65.4%) of parents reported that as a result of what their children learned, changes were made to their family's eating and/or physical activity practices. Changes reported by the parents included: 85.4% ate more fruits or tried different fruits, 84.1% became more physically active, 76.3% ate more dairy foods, 74.5% ate more vegetables or tried different vegetables, 73.4% ate more high fiber/whole grain cereals/breads, 70.3% ate less high fat or fried foods, and 69.9% used less butter or margarine (Table 4.1). Similarly, Rasmussen et al. (2006) reported a positive association between parents' consumption of fruits and vegetables and children's consumption of fruits and vegetables. They stated that parents are responsible for making healthy foods available to their children and are important role models for children. They also discussed that fruit and vegetable consumption appears to decline with age among children and adolescents, and interventions are needed to promote fruit and vegetable consumption, especially for children in lower socioeconomic groups (Rasmussen et al., 2006).

Table 4.1 Responses from Parent Surveys

Parents' Responses	Frequency (n) for Yes Responses	Percentage (%) for Yes Responses
<i>Has your child told you about:</i>		
No, my child has not told me about any of these	125	41.4%
Show Me Nutrition	108	35.8%
Organ Wise Guys	55	18.2%
Body Walk	53	17.5%
<i>Since participation in a nutritional program has your child:</i>		
Asked for more fruits, vegetables, milk, or yogurt	218	73.2%
Talked to you about being more active	193	65.6%
Talked to you about healthy food and/or snacks	189	63.9%
<i>Changes you have made in your household:^a</i>		
Eat more or try different fruits	204	85.4%
Drink more water	201	87.8%
More active (walk, bike, or exercise)	190	84.1%
Eat less at fast food restaurants	182	78.1%
Eat less salt or salty foods	179	76.8%
Eat more or try different vegetables	178	74.5%
Eat more high fiber/whole grain cereals/breads	174	73.4%
Eat more dairy foods	171	76.3%
Use less butter or margarine	165	69.9%
Eat less high fat or fried foods	163	70.3%
Drink less sugary drinks	162	72.0%
Eat less sugary foods/desserts	160	71.4%
Eat less sugary cereals	160	67.8%

^aChanges reported by parents made in the household as a result of what their children learned.

Eighty-nine parents (29.5%) responded they did not make changes in their household as a result of what their children learned in school because they were already eating healthy, 25.5% were already active, 25.2% of parents had no knowledge of what their children learned in school, 16.9% found it difficult to change the way they ate or to be physically active, and 16.2% wanted to know more about what their children learned at school (Table 4.2). When the parents were asked what factors would help them become more physically active or eat healthier, the majority of the parents, 28.5% ($n=86$), responded that learning more about what to eat and how to cook, 25.2% ($n=76$) responded that having more time, 24.8% ($n=75$) responded that a will to make changes, and 18.5% ($n=56$) responded that having the help of family or friends to be more healthy.

Table 4.2 Responses from Parents that Made No Household Changes

Parents' Responses	Frequency (n)	Percentage (%)
We already eat healthy	89	29.5%
We already are active	77	25.5%
My child has not told me anything about what he/she learned in school	76	25.2%
I have a hard time making myself change what I eat or being more active	51	16.9%
I would like to know more about what my child has learned	49	16.2%
I think healthy food costs too much	27	8.9%
I do not like the taste of healthy foods	23	7.6%

Chi-square tests were used to determine the significance of the parents' responses for changes made in the household as a result of what their children learned in the nutrition education programs. Significant differences ($p < 0.001$) were observed for eating more fruits and vegetables or trying different fruits and vegetables (Table 4.3). Domel et al. (1996) reported that significant predictors of fruit and vegetable consumption were those that targeted preferences, especially with vegetable consumption, among fourth and fifth grade children. They concluded that teaching self-efficacy and health outcome expectations from eating fruits and vegetables was not effective in elementary school children for increasing fruit and vegetable consumption. They recommended that nutrition education programs should focus on fruit and vegetable preferences of the children. Rasmussen et al. (2006) also reported a positive association between children's preferences and intakes of fruits and vegetables. Additionally, Domel et al. (1996) noted that further research should be conducted to document the role of the availability and exposure of fruits and vegetables in increasing fruit and vegetable preference and consumption among children.

Significant differences ($p < 0.001$) were observed for eating more high fiber/whole grain cereals/breads, eating less high fat or fried foods, drinking more water, and being more physically active (walk, bike ride, exercise). Gorely et al. (2009) reported that interventions involving school and parental components, which promote physical activity, could be successful in increasing physical activity in school-age children. Moreover, Powers et al. (2005) suggested that the prevalence of diet-related health conditions in school-age children could be reduced by increasing the levels of physical activity.

A significant difference was not observed ($p=0.384$) for the statement, “Do you eat less often at fast food restaurants?” (Table 4.3). It is possible parents did not report eating less often at fast food restaurants because they experienced time constraints, did not know how to cook, could purchase fast food inexpensively, or the parents and children enjoyed eating at fast food restaurants. Additionally, the FNP curricula do not specifically address eating at fast food restaurants. St-Onge et al. (2003) reported there was an increase of nearly 300% in foods consumed by children in restaurants and in the number of fast food outlets between 1977 and 1996. Although many food choices at fast food restaurants are high in calories, fats, and sugars, there are fast food options that are healthier. Glanz et al. (2005) proposed evaluating restaurant nutrition environments based on the availability of healthy food choices or options, such as healthy main dish choices low in fat and calories, availability of fruit without added sugar or sauces, availability of non-fried vegetables, and availability of small portion sizes. It was also noted that although many fast food restaurants publish the nutritional values of their menu items, this nutritional information is usually not posted at the point of selection or point of sale where it would be most informative to consumers (Glanz et al. 2005).

Table 4.3 Chi-square Results of Parents' Responses

Variables	P
<i>Changes in parents' households as a result of what their children learned in the nutrition education programs:</i>	
Eat more fruits and vegetables or try different fruits and vegetables	$p < 0.001^*$
Eat less sugary foods/desserts	$p < 0.001$
Use less butter or margarine	$p < 0.001$
Eat less sugary cereals	$p < 0.001$
Eat more high fiber/whole grain cereals/breads	$p < 0.001$
Eat less high fat or fried foods	$p < 0.001$
Eat less salt or salty foods	$p < 0.001$
Drink more water	$p < 0.001$
Eat more dairy foods	$p < 0.001$
Drink less sugary drinks (soda, sweet tea, fruit-flavored drinks)	$p < 0.001$
Eat less often at fast food restaurants	$p = 0.384^{ns}$
Are more active (walk, ride bike, exercise)	$p < 0.001$

*Significant at the 0.05 level.

^{ns}Not significant.

4.2 Teacher Survey Results

The response rate for the teacher's survey was 38.0% ($N=19$). Eleven teachers taught fourth grade, five were third grade teachers, and three were fifth grade teachers. When teachers were asked to indicate the FNP nutrition education programs which they were familiar, the results showed that the majority (89.5%, $n=17$) were familiar with Show Me Nutrition, 36.8% ($n=7$) were familiar with Organ Wise Guys, and 21.1% ($n=4$) were familiar with Body Walk. Teachers rated the overall quality of the programs and the responses from their classes for the Body Walk, Organ Wise Guys, and Show Me Nutrition programs using a 5-point Likert scale with 1=*poor*, 2=*fair*, 3=*average*, 4=*good*, and 5=*excellent*. Results indicated that teachers rated the overall quality for Show Me Nutrition as 4.6 ± 0.6 SD ($n=19$), Organ Wise Guys had a mean rating of 4.5 ± 0.7 SD ($n=11$), and Body Walk had a rating of 4.5 ± 0.8 SD ($n=6$). Additionally, teachers

indicated that their class response to Show Me Nutrition was very good and rated it as 4.7 ± 0.5 SD ($n=19$), Organ Wise Guys also had a rating of 4.8 ± 0.4 SD ($n=10$), and Body Walk had a rating of 4.8 ± 0.4 SD ($n=5$) (Table 4.4).

Table 4.4 Teachers' Responses to Overall Quality of Nutrition Programs and Class Response to Nutrition Programs

	Frequency (<i>n</i>)	Mean	Standard Deviation (SD)
Overall Quality of Each Nutrition Programs			
Show Me Nutrition	19	4.6	0.6
Organ Wise Guys	11	4.5	0.8
Body Walk	6	4.5	0.7
Class Response to the Nutrition Programs			
Show Me	19	4.7	0.5
Organ Wise Guys	10	4.8	0.4
Body Walk	5	4.8	0.4

Teachers were asked to respond to the question, “Do you think the children have changed in regards to choosing healthier food/beverage choices since receiving the program(s)?” Sixteen teachers (84.2%) responded that the children made some changes in choosing healthier foods/beverages and 15.8% ($n=3$) responded that the children made many changes in choosing healthier foods/beverages (Table 4.5). Responses from the teachers suggested that they were able to notice changes the children made regarding healthier food/beverage choices since participating in a nutritional education program, and they may have heard comments the students made and/or observed changes in the cafeteria during lunch. A similar trend, according to Powers et al. (2005) was seen by teachers who observed changes made by second and third grade students during

lunchtime regarding healthier foods since participating in a Cooperative Extension nutrition education program in Alabama. The students who received the 6-week program consumed more fruits, vegetables, and dairy products. They also had a greater understanding ($p<.001$) of nutrition knowledge and the Food Guide Pyramid when compared to students in the control group (Powers et al., 2005).

Table 4.5 Teachers' Responses to Children Making Healthier Food/beverage Choices

Teachers' Response to:	Frequency (n)	Percentage (%)
<i>Do you think the children have changed in regards to choosing healthier food/beverage choices since receiving the program(s)?</i>		
Children have made some changes in choosing healthier food/beverage choices since receiving the program(s).	16	84.2%
Children have made many changes in choosing healthier food/beverage choices since receiving the program(s).	3	15.8%
None, Children have made no changes with choosing healthier food/beverage choices since receiving the program(s).	0	0%

Results indicated that teachers reported making changes in their health behaviors. Table 4.6 shows that 84.2% ($n=16$) of the teachers ate more fruits and vegetables, ate more low-fat dairy products, and increased their physical activity, while 78.9% ($n=15$) ate breakfast more often and improved their hand washing. Additionally, 73.7% ($n=14$) of the teachers reported making healthier food/beverage choices, and 68.4% ($n=13$) indicated they ate less salty and sugary foods (Table 4.6).

Table 4.6 Changes Reported by Teachers as a Result of Nutrition Education Programs

Changes Teachers Made	Frequency (n)	Percentage (%)
Make healthier food/beverage choices:		
Yes	14	73.7%
No	0	0%
Already Practicing	5	26.3%
Eat more fruits and vegetables:		
Yes	16	84.2%
No	2	10.5%
Already Practicing	1	5.3%
Eat breakfast more often:		
Yes	15	78.9%
No	3	15.8%
Already Practicing	1	5.3%
Eat more low-fat dairy products:		
Yes	16	84.2%
No	3	15.8%
Already Practicing	0	0%
Eat less salty and sugary foods:		
Yes	13	68.4%
No	3	15.8%
Already Practicing	3	15.8%
Improved hand washing:		
Yes	15	78.9%
No	0	0%
Already Practicing	4	21.1%
Increased physical activity:		
Yes	16	84.2%
No	2	10.5%
Already Practicing	1	5.3%

When asked to provide requests, comments, or suggestions for the Body Walk, Organ Wise Guys, and Show Me Nutrition education programs, one teacher reported that all of the programs helped not only the students, but also the teachers to focus on good health and nutrition and that more teachers were health conscious. Teachers were asked, “Do you think there are any areas in nutrition, food, or health that should be taught that are currently not being taught?” One teacher responded that more physical education or teaching of exercises should be taught, and six teachers indicated that no changes should be made. Lastly, the teachers were asked, “Do you have any other comments or suggestions about programs provided by the Mississippi State University Extension Service?” One teacher indicated that the programs had a good success rate and one teacher indicated it was a great program. Table 4.7 presents the responses from the teachers that chose to reply to the three open-ended questions regarding requests and suggestions about the nutrition education programs.

Table 4.7 Teachers' Comments about the FNP Nutrition Education Programs

Questions Asked	Reponses	Frequency (<i>n</i>)
Do you have any requests, comments, or suggestions for improving the program(s)?	Body Walk	1 "Keep up the success of the program. All of these programs have helped not only the students but the teacher(s) focus on good health and nutrition we are now more body/health conscious."
	Organ Wise Guys	1 "Keep up the success of the program. All of these programs have helped not only the students but the teacher(s) focus on good health and nutrition we are now more body/health conscious."
	Show Me Nutrition	1 "Keep up the success of the program. All of these programs have helped not only the students but the teacher(s) focus on good health and nutrition we are now more body/health conscious." "No" "None"
Do you think there are any areas in nutrition, food, or health that should be taught that are currently not being taught?	"No" "More physical education or teaching of exercises that can be done." "None" "I think everything is being taught well."	5
		1
		1
		1
Do you have any other comments or suggestions about programs provided by the Mississippi State University Extension Service?	"No" "Good success rate!" "None " "I think it is a great program."	5
		1
		1
		1

4.3 Limitations of the Study

The surveys for the parents had some limitations. Schools at which parent surveys were administered were convenient samples, with 50% or more of the participants participating in the free or reduced-price meal program, and were not randomized selections for this study. The parent surveys were sent home by children to 700 parents and the response rate was 43.1% ($N=302$). Due to the number of returned parent surveys, a larger sample size and a control group should be used when comparing the results of nutrition education programs in public schools in future studies. In addition, perhaps the response format on the survey should include a *sometimes* category to better identify changes made in the household as a result of what children learned from the nutrition education programs.

Additionally, Likert scales should be used in the parent surveys for additional data analysis. The use of Likert scales in data sets will allow researchers to give significance to numerical values in a scale in order to measure central tendencies for descriptive statistics. For this study, no pre-tests were administered to determine what parents thought about nutrition education programs and what they learned as a result of what their children were taught. In future studies, it could be beneficial to administer pre- and post-tests to the parents. Doing so could allow researchers to gauge the parents' awareness of nutrition education programs being taught in schools and what they thought about the programs. Lastly, the responses for this study were dominated by parents of African American descent in Jackson, MS, and generalizability to other families of other ethnicities and other geographical regions cannot be extended. Future studies may benefit from a larger sample size and more diverse ethnic populations and geographical regions.

CHAPTER V

CONCLUSION

As obesity rates continue to rise, health issues will remain one of the main causes for premature deaths and chronic diseases worldwide. Families, particularly at lower socioeconomic levels, may be faced with food insecurities, unhealthy eating behaviors, and chronic diseases. SNAP-Ed, which is sponsored by the USDA, provides education to promote healthy behaviors, such as making voluntary food choices that are healthful at a low cost to families (Guthrie et al., 2007a).

Prevention of unhealthy lifestyles and interventions for healthy eating, such as consuming more fruits and vegetables, low-fat dairy, and whole grain products targeting children in the lower socioeconomic level, is important (Blom-Hoffman, 2008). Families in the lower socioeconomic level that adopt a healthy lifestyle can decrease their risk for chronic diseases later in life (Centers for Disease Control and Prevention, 2006). Diets with high fruit and vegetable consumption can decrease obesity because these foods are usually low in calories and high in vitamins, minerals, phytochemicals, and fiber (Blom-Hoffman, 2008; Lorson et al., 2009).

The findings from this research can be beneficial for the FNP and the MSU-ES. The findings revealed that 108 parents (n=35.8%) reported being aware of the Show Me Nutrition program when asked on the parent survey if their children told them about any

of the nutrition education programs. The findings revealed no indicators for why the Show Me Nutrition program was mentioned to the parents more than the other nutrition programs, which were the Body Walk and Organ Wise Guys programs. As such, the FNP and MSU-ES have a basis for further investigation into strengthening parents' awareness of the other nutrition education programs. This research can also be beneficial because the findings indicated there was not a significant difference in the parents' responses to the statement about eating less often at fast food restaurants. The FNP and the MSU-ES have a basis for further investigation into fast food consumption and the incorporation of nutrition education lessons in its various programs about how to make healthier fast food choices.

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APPENDIX A
PARENT SURVEY 2009

Question 7 Continued:

- Do you drink more water? Yes No
Are you more active (walk, ride bike, exercise)? Yes No
Do you eat more dairy foods (low-fat milk, low-fat cheese, and yogurt)? Yes No
Do you drink less sugary drinks (soda, sweet tea, fruit-flavored drinks)? Yes No
Do you eat less sugary foods/desserts (candy, cookies, honey buns, pie, cake)? Yes No

8. If you have not made any changes in your family practices as a result of what your child has learned at school, please tell us why. (Check all that apply)

- My child has not told me anything about what he/she learned in school.
 I think healthy food costs too much.
 I have a hard time making myself change what I eat or being more active.
 I do not like the taste of healthy foods.
 We already eat healthy.
 We already are active.
 I would like to know more about it.
 Other (Please list) _____

9. What do you think would help you become more active or eat healthier (less fat, less salt, less sugar, more fiber, more fruits and vegetables and low-fat dairy products)? (Check all that apply)

- Having more stores in my neighborhood that carry those types of foods
 Learning more about what to eat and how to cook it
 My family and friends helping me in being more healthy
 A class I can go to where I can learn these things
 Having more time
 A will to make these changes
 Other (Please list) _____

10. Programs that the family participates in: (Check all that apply)

- Child Nutrition (Free or reduced-price meals)
 Commodities
 Supplemental Nutrition Assistance Program or SNAP (formerly known as Food Stamps)
 Head Start
 TANF (Temporary Assistance to Needy Families)
 WIC
 Food Bank/Food Pantry
 I do not participate in any of these

11. Do you ever buy fresh fruits and vegetables at local Farmer's Markets? Yes No

12. Do you grow any food in a garden or grow vegetables in containers? Yes No

13. Race/Ethnicity is: Black (non-Hispanic) Hispanic/Latino
 White (non-Hispanic) American Indian or Alaskan Native
 Asian or Pacific Islander

Thank You for Your Time and Participation

APPENDIX B
TEACHER SURVEY 2009

7. Do you have any requests, comments, or suggestions for improving the program(s)?

Body Walk

Organ Wise Guys

Show Me Nutrition

8. Do you think there are any areas in nutrition, food, or health that should be taught that are currently not being taught?

9. Do you have any other comments or suggestions about programs provided by the Mississippi State University Extension Service?

Thank You for Your Time and Participation

APPENDIX C

TEACHER INFORMED CONSENT FORM

Teacher Consent Form

Title of Study: Family Nutrition Program Survey

Study Site: Selected Public Schools in Mississippi

Name of Researchers & University affiliation: Dr. Diane Tidwell and Ms. Gabrielle Bryant, Department of Food Science, Nutrition and Health Promotion, Mississippi State University

What is the purpose of this research project? The overall intent of this study is to determine if nutrition education information provided by the Family Nutrition Program (FNP) is taken home by the student, and, if so, what nutritional or physical activity changes are being made in the home as a result of these programs. The intent of FNP is to educate the child, and also to provide resources that the child takes home to educate parents. Also, we would like to receive feedback from the teachers about the programs.

How will the research be conducted? Teachers are asked to do the following:

1. You will be provided with a Parent Survey and parent letter for each student. You are asked to send the Parent Survey and parent letter home with each student and have them return it within two weeks.
2. Send a reminder note asking parents to return the survey. These notes will be provided.
3. Collect the completed Parent Surveys from each student and place them in the large envelope provided (include any unused surveys) and your county Extension Educator will collect them.
4. Complete the one-page Teacher Survey and place in the envelope also with the Parent Surveys. Seal the envelope before giving to the Extension Educator. The nutrition education being measured is that provided by the MSU-ES Family Nutrition Program Educators. Any nutrition education lessons or programs taught since August 2008 will count.

Are there any risks or discomforts to me because of my participation? None. Participation is strictly voluntary. Please do not affix names, etc., to forms, so that the results will remain anonymous.

Does participation in this research provide any benefits to others or myself? We think that learning about nutrition will provide healthy benefits to you, your students, students' parents, and to others that share in the information.

What are alternative procedures or courses of treatment that might be advantageous to me? This parental survey project is strictly voluntary for teachers and parents. You do not have to participate. This survey is being conducted to determine if the nutrition education programming efforts delivered by the Family Nutrition Program can be improved.

Will this information be kept confidential? The consent forms and survey data will be kept strictly confidential, and will be kept in a locked filing cabinet in the Department of Food Science, Nutrition and Health Promotion.

Who do I contact with research questions? If you should have any questions about this research project, please feel free to contact Dr. Diane Tidwell (Phone 662-325-0239, Email: dtidwell@fsnhp.msstate.edu) and/or Ms. Gabrielle Bryant (Phone 601-670-1539, glb40@msstate.edu), Department of Food Science, Nutrition and Health Promotion, P.O. Box 9805, Mississippi State University, 39762. For additional information regarding your rights as a research subject, contact the MSU Regulatory Compliance Office at 662-325-5220.

What if I do not want to participate? Please understand that your participation is voluntary, your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled, and you may discontinue your participation at any time without penalty or loss of benefits. You will be given a copy of this form for your records.

Participant Signature (Teacher)

Date

Investigator Signatures (Researchers)

Date

APPENDIX D
PARENT LETTERS



Dear Parent:

The Mississippi State University Extension Service and your child's school have been partnering to teach children about healthy eating and active living. Your answers to the questions on the Parent Survey will help us see how well the program is working. The survey will take about 10 minutes. You may stop at any time. Your participation is by choice. If you decide not to answer the questions, it will not affect you or your child in any way. By answering the questions, you are giving your permission to use the information to help us decide what changes may be needed for future programs. Your answers will stay private. Please do not put your name on the survey. We want all surveys to be anonymous.

Please return the survey to your child's teacher by the end of the week. If you decide not to participate, please return the blank survey form.

Thank you!

Sincerely,

Diane K. Tidwell, Associate Professor
Food Science, Nutrition & Health Promotion
Mississippi State University
Telephone: 662-325-0239
Email: dtidwell@fsnhp.msstate.edu

Gabrielle L. Bryant, Graduate Student
Food Science, Nutrition & Health Promotion
Mississippi State University
Telephone: 662-325-0368
Email: glb40@msstate.edu



Dear Parent:

If you have not already done so, please complete the **Parent Survey 2009** attached to this note. The class with the most returned surveys will receive an educational prize. Also you will be helping the Mississippi State University Extension Service plan future programs about healthy eating and active living. Your participation is by choice. If you decide not to answer the questions, it will not affect you or your child in any way. By answering the questions, you are giving your permission to use the information to help us decide what changes may be needed for future programs. Your answers will stay private. Please return the survey back to school with your child even if you decide not to complete it.

Thank you!

Sincerely,

Diane K. Tidwell, Associate Professor
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Mississippi State University
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Gabrielle L. Bryant, Graduate Student
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APPENDIX E

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER



**MISSISSIPPI STATE
UNIVERSITY**

Office of Regulatory Compliance

Post Office Box 6223
Mississippi State, MS 39762

May 27, 2009

Compliance Division

Administrative Offices
Animal Care and Use (ACUC)
Human Research Protection
Program (IRB)
1207 Hwy 182 West
Starkville, MS 39759
(662) 325-3496 - fax

Safety Division

Biosafety (IBC)
Radiation Safety
Hazardous Waste
Chemical & Lab Safety
Fire & Life Safety
70 Morgan Avenue
Mississippi State, MS 39762
(662) 325-8776 - fax

<http://www.orc.msstate.edu>
compliance@research.msstate.edu
(662) 325-3294

Ms. Gabrielle L. Bryant
117-D Helen Circle
Starkville, MS 39759

RE: IRB Study #09-120: Family Nutrition Program Parent Survey

Dear Ms. Bryant:

The above referenced project was reviewed and approved via administrative review on 5/26/2009 in accordance with 45 CFR 46.101(b)(1). Continuing review is not necessary for this project. However, any modification to the project must be reviewed and approved by the IRB prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project. The IRB reserves the right, at anytime during the project period, to observe you and the additional researchers on this project.

Please note that the MSU IRB is in the process of seeking accreditation for our human subjects protection program. As a result of these efforts, you will likely notice many changes in the IRB's policies and procedures in the coming months. These changes will be posted online at <http://www.orc.msstate.edu/human/aahrpp.php>.

Please refer to your IRB number (#09-120) when contacting our office regarding this application.

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me at jmiller@research.msstate.edu or call 662-325-2238.

Sincerely,

[For use with electronic submissions]

Jonathan Miller, CIP
IRB Officer and Assistant Director

cc: Diane K. Tidwell