

**THE HEALTH AND NUTRITION OF
MIGRANT FARM WORKERS IN
SOUTH CAROLINA**

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ABSTRACT

Migrant farm workers—a high percentage of which are Hispanic—are an extremely disadvantaged population that experiences several barriers, including language, nutrition, transportation, and access to health services. This population also suffers from numerous diseases (obesity, diabetes, and heart disease) and experiences various hazards associated with risky work, such as pesticide exposure. This study included data collection on basic health and nutrition barriers to identify areas where programs and policies can be modified to better serve migrant farm workers. In addition, data was examined to determine the effect of all-inclusive educational intervention on nutrition, dental, fitness, and food safety issues by testing the level of knowledge, attitudes, skills, and behaviors of migrant preschool children in Beaufort, South Carolina.

The first part of the project was exploratory, and consisted of key informant interviews. The interviews were conducted with migrant health providers in order to examine the nutrition and health context of migrant farm workers. In addition, the study included data based on observations using anecdotal records to obtain descriptions of camp facilities, food preparation, storage facilities, and living conditions of migrant farm workers. A review of migrant records, including a 45-question survey about each migrant child's clinical history, and a nutrient analysis of the menus served at Migrant Head Start was conducted as part of this exploratory study.

The second part of the project involved a pilot study with 21 migrant children, ages 3 to 5 years. The effectiveness of a comprehensive educational intervention on knowledge,

attitudes, skills, and behaviors using the Color Me Healthy (CMH) curriculum as a tool was assessed. One-hour educational interventions were provided daily over a six-week time period.

According to the key informants in Beaufort, migrant farm workers deal with many issues such as lack of medical insurance, lack of education in nutrition and health related topics, lack of transportation and refrigeration, and a language barrier, that make it difficult to achieve proper nutrition and health practices and behaviors. Other barriers related to their living conditions in the migrant camps were documented in the course of researcher observations at migrant camps.

A high prevalence of overweight was found among migrant children at the Migrant Head Start in Beaufort. While the food served to the migrant children at Migrant Head Start meets the requirements and standards of the USDA and of the Child and Adult Care Food Program, it was also relatively high in sodium and fat.

All migrant children significantly increased their knowledge in nutrition, food safety, and physical activity after their participation in the pilot intervention. When the pre and post test results were compared, the older children (5 years of age) performed better than younger children. For this reason this age may be a more appropriate age to begin educational interventions that target young children. The teaching style and personality of the educator providing the educational intervention may also influence the level of impact the intervention has on the children.

The information provided from this project may catalyze progress in improving the health of migrant farm workers. The knowledge base developed can contribute to

appropriate education programs, and provide needed information for disease prevention and intervention planning for migrant farm workers and their families.

DEDICATION

This thesis is dedicated to my parents, Abel and Ana María, who have supported me all the way since the beginning of my studies. Also, this thesis is dedicated to Milagritos who has been my motivation and inspiration.

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CHAPTER I: INTRODUCTION

Literature Review

The Hispanic population in the United States is growing nationwide, and it is the fastest growing ethnic group. In the United States, people of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture origins are considered to be Latino or Hispanic, regardless of their race (South Carolina State Office of Research and Statistics, 2002). Hispanics comprise the nation's largest ethnic minority (14.4 percent of the nation's total population, not including the 3.9 million residents of Puerto Rico) (Census Bureau, 2005). According to the Census Bureau, the estimated size of the Hispanic population in the United States as of July 2005 was 42.68 million (Census Bureau, 2005); the projected Hispanic population in the United States for 2050 is 102.6 million, meaning that approximately 1 out of every 4 Americans will be Hispanic (Suro, 2002).

Hispanic population in South Carolina

The rate of increase in the Hispanic population in South Carolina during the period 1990-2000 was 211.2 percent, almost four times the rate of increase of the nation as a whole (57.9 percent) (Eberhardt et al., 2001). From 2000 to 2002, the Hispanic population in South Carolina increased by only 14.9 percent—a marked slow-down from the previous decade—yet this rate still ranked South Carolina fourth among the 50 states (Eberhardt et al., 2001). Meanwhile, a significant portion of the total South Carolina population lives on a low or insufficient income: 15 percent lives in poverty, including over 20 percent of all children less than 5 years of age. Although parents may

have jobs, 26 percent of children under the age of 13 live in low-income families (Eberhart et al., 2001). As will be described below, a highly disproportionate percentage of these low-income families are migrants. The Hispanic population in Beaufort County was 2,168 in 1990, representing 3.2 percent of the total county population; by 2000, this population had risen to 8,208, or 6.8 percent (Eberhardt et al., 2001). In 2002, the estimated population of Hispanics was 9,572 (7.5 percent) (Eberhardt et al., 2001). Fourteen of the state's 46 counties experienced a faster rate of Hispanic population growth than the state average rate of 11.3; the counties of Beaufort, Chesterfield, Dillon, Edgefield, Greenville, Greenwood, Hampton, Horry, Jasper, Laurens, Marion, Newberry, Saluda, and Sumter were among these (Suro, 2002).

Migrant farm workers

A migrant farm worker is an individual whose principal employment is in agriculture on a seasonal basis (as opposed to year-round employment) and who establishes a temporary abode for the purposes of such employment; family members may or may not migrate with the worker (U.S. Department of Labor, 2006). Migrant farm workers generally follow the growing seasons across the country, cultivating and harvesting fruits and vegetables and many other food products. However, while migrant and seasonal farm workers have a crucial role in the production of fruits and vegetables in the U.S., they have an average annual income that falls below the national poverty level placing them at risk for food insecurity (U.S. Department of Labor, 2006).

Approximately 80 percent of the seasonal or migrant workers in the United States are of Hispanic origin (Mines et al., 1993). Hispanic migrant farm workers in the United States face many adversities, such as physically demanding labor, crowded and unhealthy

housing conditions, and persistent poverty (Meister, 1991; Wilk, 1993). Over 61 percent of these migrant workers live below the poverty line, which is \$9,800 annually per individual (Federal Register, 2006). In addition, food insecurity is a common problem among farm workers; a study of migrant workers in Florida found that, although their families were eligible for food stamp programs, many did not receive it (Shotland, 1989). Moreover, 30.6 percent of the participants in the study showed that they had experienced a period during which they ran out of food or did not have enough food to eat, and approximately 44 percent of the migrant workers indicated an overall lack of food (Shotland, 1989).

One possible result of such a lifestyle is the fact that the overall life expectancy of migrant farm workers is 49 years, compared with the national life expectancy of 75 (National Family Resource Program, 1990). Slesinger and Ofstead (1993) reported that only 13.3 percent of migrant farm workers thought they were in good health. The migrant population is overwhelmed with nutrition-related diseases, including obesity, diabetes, hypertension, and cancer. More than 1 in 10 Hispanic adults suffers from type 2 diabetes; a review of 7,000 visits to migrant health clinics from 1986 to 1987 revealed that diabetes was the most common chronic disease affecting this population (Migrant Clinicians Network, 1991). This high rate may be due to the prevalence of obesity among migrants (see following section, *Overweight, obesity, and food and nutrient intake among Hispanics*). Hypertension is another prominent nutrition-related health problem (Slesinger, 1992; Dever, 1991).

The poor dietary habits and repeated exposure to pesticides increase the Hispanic farm workers' risk of becoming ill through increased exposure to disease and infections

and, in some cases, developing chronic diseases, including cancer. For example, research has indicated that tuberculosis (TB) is a serious health problem—especially for migrants who work in the eastern states—and occurs more frequently among minorities and the poor (Ciesielski et al., 1991). The exposure to sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV), is also a concern of growing importance to migrant farm workers (Perilla et al., 1998). In addition, parasitic infections are almost 50 times more prevalent in migrant farm workers than in the total U.S. population (Perilla et al., 1998).

Hispanic migrant farm workers are often more concerned with daily survival than seeking preventive care (Lantz et al., 1994). The American Cancer Society states that one-third of all cancer deaths are related to dietary habits (ACS, 2000). The diets of many Hispanic farm workers do not include the micronutrients that have been found to contain a protective effect against cancer (Kowalski et al., 1999). Environmental hazards also can lead to deadly diseases, including cancer. Lantz et al. (1994) concluded in their study that, while many migrant workers were aware of the dangers associated with exposure to toxic agricultural pesticides, the majority of them were reluctant to raise issues regarding protective clothing because of their fear of losing their jobs.

Overweight, obesity, and food and nutrient intake among Hispanics

Obesity is a major problem in the United States, and the U.S. Hispanic community is in no way spared. The prevalence of adult obesity increased 75 percent between 1991 and 2000 (from 22.9 to 30.5 percent) (Troiano, 1995). The latest data from the National Center for Health Statistics (2005) revealed that 30 percent of adults in the United States 20 years of age and older (60 million people) are obese; even worse, the number of

adolescents who are overweight has more than tripled in the past two decades. According to research conducted by the National Center for Health Statistics of the Center for Disease Control (CDC), the number of overweight children doubled in the United States between 1980 and 2000 among children 6 to 11 years of age and tripled among adolescents 12 to 19 years of age (Obesity Still on the Rise, 2002). Nationwide statistics indicate that around 14 percent of children 6 to 11 years of age and 12 percent of teenagers are overweight at the 95th percentile of BMI; in other words, at least 1 child in 5 is overweight (Obesity Still on the Rise, 2002; Troiano, 1995; U.S. Department of Health and Human Services, 1996; Pareo-Tubbeh et al., 1999). Children who are overweight are at increased risk of being overweight or obese as adults.

These statistics are particularly alarming for the Hispanic population. The Hispanic population has a high prevalence of obesity and associated chronic health conditions (Mokdad et al., 1999). According to the American Obesity Association (AOA) (2002), overweight and obesity in the United States occur at elevated rates among Hispanic versus non-Hispanic, white Americans; in addition, women and individuals of low socioeconomic status in minority populations appear to be particularly affected by overweight and obesity. Cultural factors that influence dietary and exercise behaviors are reported to play a major role in the development of excess weight in minority groups. A higher incidence of obesity-related diseases, including diabetes, hypertension, cancer, and heart disease, is found among Hispanics versus non-Hispanic whites (AOA, 2002).

In addition, data from the Hispanic Health and Nutrition Examination Survey (HHANES)—a nationwide probability sample of approximately 16,000 people between 6 months and 74 years of age—and other studies of food and nutrient intake indicate that,

in this population, energy-dense, nutrient-poor foods frequently are consumed at the expense of nutrient-dense foods. This results in 1) an increased risk of high-energy intake; 2) marginal micronutrient intake; 3) poor compliance with nutrient- and food group-related dietary guidance; and 4) low serum concentrations of vitamins and carotenoids (HHANES, 2004). Ultimately, such a diet, coupled with the cultural factors affecting diet and exercise, result in high rates of obesity among Hispanics.

Migrant children's health conditions

The children of seasonal and migrant workers are not excluded from health problems. Poor dental health, obesity, diabetes, anemia, and cardiovascular disease are among the most frequent nutrition health problems found in migrants (Nurko et al., 1998; Thomas, 1996). The infant mortality rate among migrants is 25 times greater than the national average (National Family Resource Program Inc., 1990). Migrant children between the ages of 6 weeks and 5 years exhibit a higher than normal prevalence of asthma (Center for Disease Control and Prevention, 1996) as well as baby bottle tooth decay, cavities, and obesity (Anderson & Butcher, 2006). Many migrant farm worker children suffer from malnutrition, which can have a detrimental effect on growth and proper development (National Family Resource Center Inc., 1990). According to the American Heart Association, 10 percent of Hispanic preschool children are overweight compared to preschool children in the United States, 7 percent higher than in 1994 (Obesity Still on the Rise, 2002). Sixty-one percent of migrant children have had at least one health problem, while 43 percent have had two or more problems (Dever, 1991). Adding to the problem, almost three-quarters of migrant and seasonal farm worker children (72.8

percent) have no health insurance (Gwyther, 1998), and only 60 percent are immunized against childhood illnesses (Gergen et al., 1988).

Exposure to pesticides, infectious disease, and substandard living conditions make farm worker children particularly susceptible to poor health (Slesinger & Ofstead, 1993). According to Schneider (1986), migrant children's health conditions can be subdivided into four categories: 1) diseases and conditions caused by poor living conditions, 2) nutritional problems, 3) congenital anomalies, inherited conditions, and allergies, and 4) neglect and lack of adequate medical treatment. The first category deals with diseases and conditions caused by poor living conditions, which include overcrowding and frequent moves to new climatic areas with different water supplies and native viruses. Such a lifestyle can impact children's psychological health as well. Due to the numerous moves that migrant farm workers make, 50 percent of their children are one grade level of skills behind their age grade (Salerno, 1991). Many of these children need three years to advance one grade level. Achieving an education is a challenge for migrant farm workers, a dilemma made even more daunting by evidence that 85 percent of a child's intellect, personality, and social skills are formed by age 5 (Partnership for Children, 2006). These educational challenges, coupled with frequent moves and poor health, can result in long-term psychological effects.

The second category deals with nutritional issues. Poor dental health, obesity, diabetes, anemia, and cardiovascular disease are among the most common nutrition-related health problems identified in migrant farm workers and their families (National Center for Farmworker Health, 2000). For example, Hispanic children experience a disproportionately high prevalence of early childhood caries (ECC)—a dental condition

characterized by significant decay of a child's teeth—than children from other ethnic backgrounds (Flores et al., 2002). Mexican-American children whose families live below the poverty line have the highest rate of ECC compared to poor African American children and poor white children (Surgeon General, 2000). In addition, obesity in U.S. children has increased dramatically over the past three decades, with an estimated one in four children in the United States being “at risk” for being overweight (BMI between 85th and 95th percentile) and 11 percent being obese (BMI equal to or greater than the 95th percentile) (Nicklas et al., 2003). Both international and national studies have shown that Mexican-American children, in particular, have higher rates of obesity than other Hispanic Americans and other ethnic minorities (Dwyer, et al., 1995; Martorell, Khan, Hughes, & Grummer-Strawn, 1998).

The third category of health conditions deals with congenital anomalies, inherited conditions, and allergies. Migrant farm workers' children of all ages are at increased risk for respiratory and ear infections, short stature, undiagnosed congenital anomalies, delayed development, among other health issues (American Academy of Pediatrics, 1998). More than a third of the migrant children examined in one study suffered from intestinal parasites, severe asthma, chronic diarrhea, vitamin A deficiency, chemical poisoning, or continuous otitis media (Dever, 1991; Flores et al., 2002). The last category of health problems deals with neglect and the lack of adequate medical treatment. Hispanic children are significantly more likely to have sub-optimal health status, spend more days in bed for illness, and make fewer physician visits than their non-Hispanic white counterparts (Flores et al., 2002). The constant movement associated with migration prevents the children of migrant farm workers from enrolling in state-

administered public health insurance programs—73 percent of migrant and seasonal farm worker children have no health insurance (National Center for Farmworker Health, 2000). In a 1998 Wisconsin-based study, 20 percent of the families surveyed paid for some or all medical bills “out of pocket” (Slesinger & Ofstead, 1993). Clearly low-income migrant workers with little or no insurance are at a disadvantage, which is particularly alarming given their elevated rates of health-related issues.

Food insecurity

In 2000, 10.5 percent of U.S. households were food insecure (Olson & Holben, 2002), while as recently as 2004, 12 percent were food insecure (Economic Research Service, 2003). *Food security* means access of all people at all times to enough food for an active, healthy life (Olson & Holben, 2002). Thus, *food insecurity* results from a lack of sufficient access to nutritious food by all members of a household to fulfill nutritional needs. Hunger, meanwhile, is classified as a severe level of food insecurity, in which food intake is low and involuntary (Guthrie & Nord, 2002). Among food insecure families, 44 percent are below the poverty level (Nord, Andrews, & Carlson 2003). Hispanic families have higher levels of food insecurity than other ethnic groups (Melgar-Quinonez, et al., 2003)

Food insecurity affects different ethnic groups in various ways and at many different levels. One study on low-income Hispanic families whose children participated in different federally or privately supported programs, such as Head Start or WIC, demonstrated that Hispanic families with more food insecurity consume a poorer diversity of foods, in particular being short on fruits and vegetables (Melgar-Quinonez et al., 2003). On the other hand, a relationship exists between food insecurity and both

obesity and being overweight, particularly among children. Low-income families generally consume lower cost foods that are high in energy and calories, despite being low in nutritional value. This often results in excessive weight gain. Another reason is that households actually may prefer quantity instead of quality, for a variety of reasons, which may include an inadequate understanding of nutrition or lack of money. A third effect is that families with food insecurity eat more when food is available, resulting in overeating (Polivy, 1996).

Head Start program

The best method to help improve dietary patterns among children is early intervention (Birch, 1999). Recognizing this fact, the US government responded by creating the Head Start program, which is intended to promote healthy development in low-income children through early intervention. Managed by local non-profit organizations throughout the country, Head Start agencies provide a range of unique services in the areas of education and early childhood development; medical, dental, and mental health; nutrition; and parent involvement (Head Start Bureau, 2006). Head Start and Early Head Start are comprehensive child development programs that serve children from birth to age 5, pregnant women, and their families. They are child-focused programs and have the overall goal of increasing the school-readiness of young children in low-income families (Head Start Bureau, 2006). Children receive free medical and dental care, and enjoy playing indoors and outdoors in a safe setting; although most participating children are between three and five years of age, services are also available to infants and toddlers in selected sites (Head Start Bureau, 2006).

Head Start provides meals and snacks as part of its nutrition services to children who attend Head Start centers. Children that spend more than 8 hours each day in the Head Start program, receive at least 66 percent of their nutrient needs from the center's nutrition services (United States Department of Agriculture, 2005).

These meals are free of cost and must meet USDA and Child and Adult Care Food Program meal pattern requirements. The foods served at the Head Start must be high in nutrients and low in fat, sugar and sodium; that is appropriate to his or her nutritional needs and growth.

Head Start uses The Dietary Guidelines for Americans and MyPyramid as a guide to provide a variety of healthy foods and healthy behaviors to the children enrolled (Head Start Bureau, 2006). Also, Head Start follows recommendations about nutrient standards from the National Research Council: Diet and Health Recommendations, Institute for Cancer Prevention, Nutrition Facts Label (FDA), and American Heart Association (United States Department of Agriculture, 1992).

Although Head Start intends to serve children a broad range of foods from each of the food groups, it is encouraged to do so in a way that is sensitive to differences in culture, religion, ethnic background, and personal food preferences (Head Start Bureau, 2006; United States Department of Agriculture, 1992). Foods served reflect the ethnic and cultural composition of the group and preferences of the families; and the quantity offered meet children's need (Head Start Bureau, 2006). The total daily meal requirements for food served in the Migrant Head Start in Beaufort (breakfast, lunch, and dinner) for preschool children are: 1600 kcal, 50 grams of protein, 130 grams of carbohydrate, 53 grams of fat, 19 grams of saturated fat, 19 grams of monounsaturated

fat, 19 grams of polyunsaturated fat, less than 170 milligrams of cholesterol, 2000 (IU) of vitamin A, 0.6 milligrams of thiamin, 0.6 milligrams of riboflavin, 8 milligrams of niacin, 0.6 milligrams of vitamin B6, 1.2 micrograms of vitamin B12, 12 micrograms of biotin, 40 to 45 milligrams of vitamin C, 200 (IU) of vitamin D, 3 milligrams of pantothenic acid, 500-800 milligrams of calcium, 7-10 milligrams of iron, 130 milligrams of magnesium, 500 milligrams of phosphorus, 3800 milligrams of potassium, 2000 milligrams of sodium, and 3 to 5 milligrams of zinc (USDA, 2006).

Migrant Head Start provides the same comprehensive services as typical Head Start programs, but the program targets children 6 weeks old to age 5 from families who follow seasonal agricultural work and move to follow the crops (Head Start Bureau, 2006). In South Carolina, Migrant Head Start programs usually open in mid-May and close in mid-July. The program aims to support child wellness, in part, by providing nutrition services that both enhance and balance nutrition at home and within the community (Head Start Bureau, 2006). To qualify for the Migrant Head Start, a migrant child must have moved within the past three years across state or school district lines with a migrant parent or guardian to enable the child, the child's guardian, or a member of the immediate family (including a spouse) to obtain employment in an agricultural, fishing, or food processing activity.

Of the 203 Head Start programs in South Carolina, only 10 are Migrant Head Start programs: Beaufort County School District in Beaufort, Camp Care Road MHS in Johns Island, Gleams Human Resources Commission Inc. in Greenwood, Gleams Migrant HS in Trenton, Lake City MHS in Lake City, Manning MHS in Manning, Rural Mission Inc. in Johns Island, Saint Helens Early Learning Center in St Helena, Saint James Church in

Johns Island, and Wateree Community Actions, Inc. in Sumter (Head Start Bureau, 2006).

Health-related education

The primary role of the Head Start program is promoting healthy lifestyles among young children. To this end, the program focuses on several areas, including nutrition education, physical activity, and dental health intervention. The American Dietetic Association (ADA) recommends that nutrition education be part of any program involving childcare since every child must have the opportunity to be taught about food, food sources, nutrition, and the relationships between nutrition, physical activity, and health (ADA, 1999). Furthermore, researchers have shown that eating habits developed during childhood continue into adulthood (Healthy People 2010, 2000). The U.S. Department of Agriculture's (USDA) Nutrition Education and Training (NET) Program recommends that nutrition education must be a key educational part of all child nutrition programs and be offered in all schools, childcare facilities, and summer sites (Mandell, 1993).

The preschool age is an excellent time to help children to become familiar with the idea that eating an appropriate diet is part of a healthy lifestyle because attitudes and habits formed throughout preschool years are likely to be carried into the future (Martin & Kern, 1992). Experiences in childhood in food- and nutrition-related matters have an important impact on the future eating habits and health of preschool children (Fuhr & Barclay, 1998). Head Start programs as well as the NET Program were created to improve the nutritional status of children and to prevent disease, promoting healthy behaviors at schools and childcare locations (Kalina, Phillips. & Minns, 1989).

Healthy lifestyles go beyond knowledge of nutrition. Exercise helps children to improve their health mentally and promote physical growth (Physical Activity and Health: A Report of the Surgeon General, 1996). The federal Dietary Guidelines for Americans recommend that children and teenagers be physically active for at least 60 minutes daily (USDHHS & USDA, 2000). A physically active way of life adopted in childhood has a greater chance of continuing into adulthood than an active lifestyle developed later in life (Pate et al., 1987). The Head Start program focuses on physical education and exercise by incorporating physical activities into the educational programs offered, and by providing safe indoor and outdoor environments where children can play.

Dental health is also a priority for a healthy life. Many children fear going to the dentist. This fear is related to many factors, including prior painful dental experiences, increased fears in general, and the influence of dental fear in the mother (Baier et al., 2004). Dental problems are one of the top five health problems for migrants ages 5 through 29. It remains among the top 20 health problems for farm workers of all other ages presenting for care. Moreover, oral health among migrant farm workers is worse than the general population (Koday et al., 1990). Cooperative behavioral management with children and families can assist in promoting optimal dental care (Harper & D'Alessandro, 2004).

A study conducted by Siegal, Yeager, and Davis (2004) of children enrolled in Ohio Head Start assessed the dental caries prevalence rate among children as well as factors relating to dental care access. They performed oral screenings on 2,555 children, aged 3 to 5, at 50 centers using probability-proportional-to-size sampling. The researchers also surveyed the children's guardians. They found that 38 percent of the children screened

had experienced dental caries and 28 percent had at least one untreated decayed tooth. Of the children with caries experience, 73 percent had decayed teeth, while the remaining 27 percent had had restorations only.

With regards to dental care access, 11 percent of the guardians had not been able to receive the dental care they wished for their children during the previous 12 months, most often due to the cost of care or lack of insurance. Nine percent of the children had had a toothache in the previous 6 months. Although 85 percent of the Head Start children had visited a dentist in the previous 12 months, another 10 percent had never visited a dentist. One major conclusion gleaned from this study was the high prevalence of dental caries among Ohio Head Start children—a prevalence consistent with reports from other states (Siegal, Yeager, & Davis, 2004).

Related research studies

Numerous studies have examined the impact of nutrition education on the knowledge, skills, and behaviors of children and adolescents (Jukes, 2005; Rivera et al., 2004; Perez-Rodrigo & Aranceta, 2001; Kaiser et al., 2002; Clark, 2006; Passehl et al., 2004; Gottesman, 2003). For example, researchers found that childcare providers using Color Me Healthy (CMH)—a nutrition education program designed for use with preschool children in family daycare homes, Head Start classrooms, and child care centers—observed positive impacts on healthful eating and physical activity in the preschool classroom (Dunn et al., 2004). In the evaluation, participants initially attending CMH training completed a training evaluation, which was mailed to all 4,500 participants. The data were collected from 1,102 respondents and indicated that 91.2 percent of childcare providers reported using the program in their classroom. Of those using the program, 92.0

percent found the program to increase physical activity in children and 91.8 percent said it increased knowledge about movement in children. In addition, 93 percent said that children increased their level of knowledge about healthy eating, and 79 percent indicated that they had seen positive changes in the children with respect to healthful eating (for example, more willing to try new foods). Providers also indicated that they had observed positive changes in the children with respect to fruit and vegetable recognition since they started using CMH (82 percent). Most childcare providers (96.6 percent) gave the program an excellent or very good overall rating, and 99.8 percent indicated that they would use it again (National Academy for State Health Policy, 2006)

Three studies in particular utilized similar methodologies to the current study and will be discussed in more depth. Goerlick and Clark (1985) conducted a study involving 187 children from 3 to 5 years of age from 20 classrooms in 14 schools who were randomly assigned into the intervention and control conditions. The intervention consisted of 12 nutrition-related educational activities (including tasting foods) that were conducted twice a week for 6 weeks. The results indicated that those in the intervention group had higher post-test nutrition knowledge scores, particularly in food identification, and—among older children—increased knowledge of tooth brushing and food choices as well.

In another study with preschoolers, researchers compared a microcomputer nutrition lesson to a traditional one using a puppet and picture cards (Turner & Evers, 1987). Researchers found that both methods were equally effective in increasing nutrition knowledge. A total of 55 children completed the project (pretest, lesson, and posttest). They were separated into two groups: one used the microcomputer, the other the

traditional method. For all of the groups, posttest scores were higher than pretest scores (Turner & Evers, 1987).

The final study reviewed assessed the effects of a preschool health education curriculum on the health knowledge of children aged three to six (Hendricks, 1989). The sample consisted of nine experimental preschool programs (n=194) and three comparison preschool programs (n=73). A picture identification test assessed children's pre- and posttest knowledge of the five senses, safety, nutrition, dental health, personal responsibility, emotions, hygiene, and drugs/medicines. Posttest knowledge scores increased by 22 percent among children in the experimental group, and by 12 percent among children in the comparison group. Hendricks (1989) found significant differences between experimental and comparison group students.

Objectives

A lack of information exists on the nutrition knowledge, dietary practices, and overall health education needs among migrant farm workers and their families. The purpose of this study is to:

1. Collect pilot data on basic health and nutrition and barriers that obstruct health and nutrition status among migrant farm worker families in Beaufort County, SC;
2. Identify areas where programs and policies can be modified to better serve this population; and
3. Examine the effects of nutrition, dental, and fitness educational interventions on the level of knowledge, attitudes, skills, and behaviors of preschool children, with respect to dietary and physical activity habits, in a Migrant Head Start program.

This pilot study will provide data that can serve to objectively identify priorities for outreach education and interventions. It will provide crucial information for the development of a larger project on this topic in South Carolina. The knowledge base developed through this research project will further the development of policy, contribute to appropriate educational programs, and provide needed information for disease prevention and intervention planning for the migrant farm worker population. The findings may help Migrant Head Start more effectively develop, implement, and evaluate its nutrition services.

CHAPTER 2: MATERIALS AND METHODS

Overall Study Design

The Clemson University Office of Research Compliance/Institutional Review Board (IRB), approved all the materials and procedures used in this study. This study comprised of two parts. Part 1 is an exploratory, qualitative study examining the nutrition and health context of migrant farm worker families in Beaufort, South Carolina, through key informant interviews, observations using the anecdotal records procedures (which is an effective method to define precise behavior or information for which one is looking) (Henderson et al., 1988), and a review of Migrant Head Start records (a 45-question survey asked of parents during enrollment week). In addition, this part includes a nutritional analysis of the menus served at Migrant Head Start. Part 2 is a pilot study involving both pre- and post-questionnaires to determine the effectiveness of an educational intervention on knowledge, attitudes, skills, and behaviors of preschool children in the Migrant Head Start program in Beaufort using the Color Me Healthy (CMH) curriculum as a tool. The Statistical Package for Social Sciences (SPSS) software, Version 10.0 for Windows, was used to conduct statistical calculations. Descriptive statistics were calculated for all survey questions and the analysis of the menus.

Part 1

Key informant interviews

Seven key informant interviews were conducted in Beaufort County. The researcher met with each of the key informants during the six-week program. The key informant interviewees were the Health Coordinator from the Migrant Clinic in Saint Helena, the

Health Coordinator at Saint Helena School, the Migrant Head Start Program Coordinator, the Migrant Head Start Family Service Liaison, the Education Coordinator, a preschool teacher, and a former migrant worker from Beaufort currently working in the Migrant Head Start office.

The Health Coordinator from the Migrant Clinic was selected as a key informant because she has been working as a doctor with this population over the past five years. She coordinates all medical-related subjects of the migrant farm workers and serves as a linkage between the Migrant Head Start and the Migrant Clinic. As such, she has a special insight and knowledge about the health problems of and barriers facing migrant farm workers.

The Health Coordinator at Saint Helena School coordinates health services between the school system and the health provider (the Migrant Clinic). She has extensive experience in working for several years with migrant children and their parents. These experiences enable her to provide information about health education-related issues facing migrant workers and their families.

The Migrant Head Start Program Coordinator has special knowledge about the needs of the children of the migrant farm workers. The current researcher has worked directly with her during the program. The Migrant Head Start Family Service Liaison was selected because she worked as a social worker in the East Coast Migrant Head Start Project for almost eight years, which provided her with exceptional overall knowledge concerning this population.

The researcher also selected the Education Coordinator from Saint Helena School in Beaufort because she is responsible for coordinating education, nutrition, and health

services for the children and parents of the migrant farm workers—a position in which she has served for the past five years. In addition, a preschool teacher was selected to tap into her first-hand information related to children’s education, behavior, health, and preferences. Finally a former migrant child currently working as an assistant in the Migrant Head Start office was also asked to participate.

These key informants were asked a series of eight open-ended questions to which they could provide detailed responses. The following Table 2.1 provides the questions asked:

Table 2.1 Questions for Key Informant Interviews	
1.	Describe the migrant farm worker population that is in the community – place of origin, gender, do women and children accompany the males, migration status, migration patterns, and seasonal nature of work, type of farm work and environmental hazards associated with work, etc.
2.	Tell me about the services you provide to migrants.
3.	What are the migrant farm worker health issues? Describe the physical health of Migrants and their family members and access to health services.
4.	How well are these issues met? Where are there gaps?
5.	What are specific nutrition/dietary problems of migrant farm workers and their families? What are the barriers to achieving good nutrition? Describe the living conditions and how this would impact their eating habits and food choices.
6.	What Food Assistance Programs are available for migrants and family members? For example, WIC, Food Stamps, Food Banks, etc.
7.	How well are these programs accessed? What are the barriers to food assistance program participation?
8.	What are common things that the migrant families have done to get through the month with enough food for themselves and their families? What “risky” behaviors are used by migrants, such as eating food from dumpsters, road kill, stealing, etc.

All interviewees signed a consent form (Appendix 2) that informed them about the procedures of the interview. Interviews were audio-taped and transcribed. Hard copies of the transcribed interviews were obtained and read through several times in order to become familiar with the data (Krueger, 1994). A thematic analysis—a procedure used to

encode qualitative information (Roberts, 1997)—was used to process the transcribed key informant interview data. Themes were identified and then categorized for subsequent analysis. The frequency with which each theme was mentioned across participant data was tallied and key trends and comments were summarized (Boyatzis, 1998). The key informant interviews included the following content domains: 1) demographic composition of the migrant farm worker population; 2) environmental hazards associated with work; 3) perceived health status; 4) nutritional status or food choices; 5) barriers to achieve good nutrition; 6) barriers to health care; 7) available health services; and 8) food assistance program participation.

Observations

The researcher visited the migrant camps a total of four times. The first visit to the migrant camps was made during the last week of May 2005. The migrant families had not yet arrived, so the camps were empty, giving the researcher the opportunity to observe the conditions of the dwellings and the sanitary services. The facilities became occupied by migrant families in mid-June. The subsequent three visits took place when the migrant families were in residence. During these visits, the researcher explained the project, obtained consent, and observed living conditions. The observations focused on an overview of the camp facilities, dormitories, restroom and shower facilities, kitchen, and dining facilities.

Records review

A review of the children's enrollment records from the Migrant Head Start program was conducted. This survey deals with the clinical history of the children, weight and

length at birth, current anthropometric data, allergies, food allergies, pesticide exposure, diseases, and additional demographic data.

Analysis of the Food Served

Copies of the menus (breakfast, lunch, and dinner) from the Migrant Head Start in Beaufort were obtained and analyzed using the Food Processor SQL Nutrition Analysis & Fitness Software. All menu items were coded according to a set of standards established by the Food Processor researchers. This standardization process was necessary because recipes and exact preparation procedures were not available. The menu items were analyzed using the minimum portion sizes for children three to six years old required by the USDA. The mean energy and nutrient content of each 19-day menu was determined. The nutrients analyzed were protein, total carbohydrates, total fat, saturated fat, polyunsaturated fat and monounsaturated fats, cholesterol, vitamins (including A, B₁, B₂, B₃, B₆, B₁₂, Biotin, C, and D), calcium, iron, magnesium, phosphorus, potassium, sodium, and zinc. The percentage of energy from carbohydrates, protein, and fat was calculated for comparison to the recommendations of the Dietary Guidelines for Americans (USDA, 2005) for these nutrients.

Part 2

Intervention population

The children were enrolled by the Migrant Head Start program at Saint Helena Early Learning Center in Beaufort County, South Carolina. All of the children's parents were working as farm workers at that time. The study included preschoolers of Hispanic origin who were between the ages of 3 and 5. Before the program a letter of consent was signed by the children's parents (Appendix 3).

General description of the intervention

The intervention was delivered at the Migrant Head Start program at the Saint Helena Early Learning Center for the Beaufort County School District in Beaufort, South Carolina. The program was offered one session a day, Monday through Friday, for 60 to 90 minutes over the six-week course of the Migrant Head Start program. The interventions were conducted either in a classroom setting or in the gym. Two assistants from the Migrant Head Start program who were former migrant children themselves were assigned to help the investigator conduct the classes. The interventions were as follow: 1) Passive or Indirect Education, 2) Cooking Classes, 3) Dental Hygiene Intervention, 4) Handwashing Intervention, 5) Food Guide Pyramid Intervention, 6) Physical Activity Intervention, 7) Color Me Healthy Intervention, 8) Camp Visit or “Visita al Campo.” The description of each intervention is explained next below.

Passive or indirect education

The passive or indirect education consisted of three types of posters (15 units) placed in strategic places throughout the school, including in classrooms, next to the principal’s office, in halls, near the vending machines, and at the school entrance. The posters contained messages intended to promote healthy eating behaviors and regular physical activity.

Cooking Classes

A one-hour cooking class was held each Friday for six weeks. Children wore chef hats in each class. In these classes, children have the opportunity to learn about cooking skills, practice these skills, and demonstrate the skills themselves. All ingredients and equipment required to make the recipes were provided in the class. The children also

received a recipe book (Appendix 4), which included all the recipes created during the six-week program. The recipes were easy to cook, culturally acceptable, and low cost; they included ham and cheese quesadillas; vegetarian quesadillas; a lettuce, tomato, cheese, and ham sandwich on wheat bread; a banana, reduced fat peanut butter, and corn flakes snack; fruit salad; and a vegetable salad. All the food prepared during the cooking classes was taken home by the children along with the recipe.

Dental hygiene intervention

For this intervention, Milagritos Gálvez DDS, from Chicago, Illinois, provided informational brochures, decals, tooth brushes, flavored toothpaste, and an adult-sized tooth costume with a gigantic brush nicknamed Mr. Tooth. Mr. Tooth visited each classroom for a few minutes just after lunch every Wednesday to encourage children to take care of their teeth and occasionally direct them to the Ronald McDonald Care Mobile.

Every Wednesday, an interactive class reviewed topics including plaque and how the foods eaten cause bacteria in the mouth to produce acids that cause tooth decay as well as how children can prevent decay by eating a balanced diet, restricting the number of between-meal snacks, and choosing nutritious foods like raw vegetables, plain yogurt, cheese, or a piece of fruit. Mr. Tooth always provided a gift (coloring books, toothbrushes and flavored toothpastes, decals, and informative brochures) to each child who provided a correct answer to questions about dental care and to each child who assisted him.

Handwashing intervention

This program included a 90-minute session on proper handwashing techniques. The session began using “Fight BAC puppets” to introduce the importance of handwashing. Children were then asked to wash their hands as usual. The researcher observed each child in order to determine if they washed their hands correctly. The children then received a fluorescent lotion for their hands and were asked to wash their hands again. Finally, children placed their hands under a ultraviolet light, which revealed any residual fluorescence. Children were taught that this residue was analogous to residual bacterial contamination. A Glitterbug kit was used as a tool for this intervention (see Appendix 5).

Food guide pyramid intervention

For this intervention, which occurred 3 times a week for 45 minutes each, a 6-foot tall interactive Spanish pyramid was manufactured from a large piece of cardboard to be used in almost all lessons. This pyramid included all the food groups as well as the recommended number of daily servings for each. It also featured colored pictures of fruit, vegetables, dairy products, meats, fish, poultry, sweets, fat and oils, cereal, rice, and beans; all pictures could be attached to the surface of the pyramid using paste. The lessons focused on three points for each of the pyramid groups: 1) identification of foods in each group; 2) the number of recommended daily servings per group; and 3) the amount of food that equals one serving. Children were encouraged to participate; each child received a food pyramid toy, fruit and vegetables stickers, a three-dimensional paper food pyramid, and coloring books on the food pyramid.

Physical activity intervention

The physical activity session lasted 60 minutes (including a 5-minute warm-up and 5-minute cool-down). This intervention took place three times per week over the six-week program and focused on games such as cone races, obstacle courses, soccer, vegetable puppet pick-up, and musical chairs.

Color Me Healthy intervention

This intervention used the CMH kit, which was developed by the North Carolina Cooperative Extension, Department of Family and Consumer Sciences. Nine of 12 total lessons were used; three lessons were omitted due to the lack time and because the children were not allowed to leave school during school hours. The CMH intervention includes nutrition activities geared to motivate young children's senses, including touch, smell, vision, hearing, and taste. The program uses color, music, and an exploration of all senses in order to promote healthy behavior. Children have the opportunity to express their thoughts and feelings and interact and participate throughout the learning process. This intervention included lessons entitled: *Singing and Dancing with Color Me Healthy; Eat A Rainbow of Colors; Where Can We Be Physically Active?; Try New Foods; I Can Feel My Heart Beat; Snack Attack; It's Milking Time; Where Do the Colors Grow?; Activity Alphabet; and Imaginary Trips.*

Camp visit or "Visita al campo"

The researcher and staff from Migrant Head Start made two Friday visits to the migrant camps during the six-week program. Staff from the San Francis Catholic Church, Head Start Program, local hospitals, and dental centers (Ronald McDonald Dental Care Mobile) also participated in the camp visits. The farm workers were informed about the

visits a week prior to each event. The main purpose of this activity was to learn and understand the culture and living conditions of migrant farm workers.

The Migrant Head Start and Migrant Education Program received donations of food, clothes, and other items for the migrant workers and their families, which were distributed during camp visits.

Brochures containing nutritional information as well as parent newsletters (written in simple and understandable Spanish) from the CMH curriculum were distributed. During the second camp visit, dental education was provided, and Mr. Tooth visited the camps to reinforce the dental education.

Table 1.1 (Appendix 1) shows the timeline for the interventions

Evaluation Survey Instrument to Test Children's Knowledge

This study utilized questionnaires in English (Appendix 6) and Spanish (Appendix 7) to evaluate 21 children at the baseline and at the end of the intervention. A team of nutrition professionals from Clemson University evaluated the content validity of the questionnaires.

The questionnaire was developed using questions from existing validated surveys developed by the University of Wisconsin-Extension (University of Wisconsin, 2005) and the College of Human Ecology of Kansas State University Extension (Kansas State University, 2005). The survey was translated from English into Spanish. Table 2.2 at the next page describes these briefly:

Table 2.2 Description of questions used in Pre-Test and Post-Test		
Code	Questions	Description
P	12	FOOD GUIDE PYRAMID Multiple choice alternatives
B	13	BEHAVIOR QUESTIONS “Almost always”, “Sometimes”, and “Not very often” alternatives
K	18	KNOWLEDGE QUESTIONS Multiple choice questions about knowledge on hand washing, food safety, healthy food choices, etc.
Total	43	

This questionnaire was administered both before and after the intervention. The children were evaluated one by one during the first week of the program, which helped the researcher to get to know each of children individually. The methods used included reading all 43 questions to each child, alternating from Spanish to English and vice versa as needed. A full-colored laminated copy of the questionnaire was given to the child, who returned it when finished with the assessment. Almost all the questions had drawings and pictures to make it more fun and easier to understand. Children were asked to identify the picture on the question and indicate their answer by pointing to the figure; for other items, children had to select their answers verbally after the question was read. The researcher marked the children’s answers in copies for records. After the survey, each child received a coloring book with crayons.

CHAPTER 3: RESULTS

Part 1

Key informant Interviews

Demographic composition of the migrant farm worker population

Almost all of the interviewees (7) reported that most of the migrant families came from Florida (8/10) and some directly from Mexico. They stated that eighty percent of the families are of Mexican origin and the rest come from Haiti, Guatemala, Honduras, El Salvador, Puerto Rico, and Asia. They also agreed that all of the families lived below the poverty line. Five of the seven key informants said that a large percentage—approximately 80 percent—of the migrant farm workers are male, but many women work in the packing houses. The key informants also concur that generally, these laborers work on farms that grow tomatoes, watermelons, cucumbers, and bell peppers in Beaufort County in South Carolina

All the key informants agreed that migrant farm workers live in migrant camps provides by the farmers, mobile homes, hotels, or motels (usually only for supervisors and paid for by the farm owner). Typically, migrant families (husband, wife, and children) live in the migrant camps in one room with two beds—one for the parents and the other one for the children. Both migrant and seasonal farm workers live in Beaufort County. Migrant workers move from one residence to another, and typically travel from Florida to New York. Seasonal farm workers, meanwhile, stay in Beaufort after the agricultural season ends, working in construction or other jobs until the next agricultural season begins.

According to the key informants, the large majority of migrant farm workers come to the United States with only one thing in mind: make enough money to support their families back home. It is believed that many workers send the majority of the money that they make in the US back to their families in their country of origin, keeping just enough to buy food. After a while, migrant farm workers may bring their families to the United States. Some farm owners pay migrant workers in tokens, called “fichas.” For example, at one farm one ficha would equal 44 cents, the wage for each 10-gallon bucket of fresh fruit or 2 units of 10-gallon buckets of vegetable they pick. Migrants accumulate these tokens during the week and then cash them in on Friday.

Work associated environmental hazards

Environmental hazards associated with migrant work include exposure to temperatures as high as 90 to 105 degrees Fahrenheit, back problems, and muscle injuries from lifting heavy buckets. In addition, all of the key informants believe that pesticides tremendously affect the health of migrant farm workers, possibly causing certain types of cancer, respiratory illnesses, dermatitis, and eye injuries. It is believed that many workers do not receive the adequate training in pesticide application and do not receive special clothing or protective equipment to minimize their contact with the chemicals.

Perceived health status

In general, according to the informants, the farm workers were found to be in good health, despite the hard work (which often includes heavy lifting) that is associated with working in the fields. Back pain and injuries were their main complaints. Some workers became dehydrated while working in the fields on hot days. All key informants believed that diabetes, poor dental health, heart disease, overweight, and obesity are health issues

that many migrants face. The key informant from the Migrant Clinic in Beaufort County revealed that a large number of migrant women and men are overweight or obese and are at risk of developing hypertension and diabetes. Informants also noted high incidence of childhood obesity and indicated that children suffer from asthma, respiratory infections, and ear infections.

Half of the interviewees stated that alcohol consumption among male migrant farm workers is a serious problem. One of the participants said that some men go to work intoxicated and that the previous year one man fell asleep under a big truck and was killed when the truck ran over him. In addition, this provider said that access to basic health services was problematic. Migrant farm workers have access to the Migrant Clinic; however, they need to pay 30 dollars for each appointment, and medicines are not included in this fee. A worker has to pick almost 70 buckets of fruit or vegetables to earn that much money.

Some of the interviewees said that migrant families never visit a dentist because of their fear of dentists, and the expense. Their limited or lack of health insurance coverage makes it difficult for them to pay for dental or medical services. One of the key informants said that baby bottle syndrome is a common problem in children and that many adults and children have rotting teeth.

One key informant mentioned that they believe HIV/AIDS is prevalent among migrant farm workers; however, no data are available on its prevalence among this population.

Food choices and barriers to achieving good nutrition

The most commonly mentioned barriers to achieving good nutrition were the lack of refrigeration at migrant camps, lack of education, lack of transportation, inadequate cooking facilities, and lack of cooking skills. Lack of money, also is considered a barrier to achieving good nutrition. It is important to take into account that most of the migrant farm workers send great part of their income to their families on their country of origin. Two thirds of the interviewees believed that nutrition education is the only way to help migrant farm workers make better food choices. One key informant said that migrant farm workers need to eat a more nutritious diet and they do not eat enough green vegetables, preferring tortillas, beans and rice to vegetables:

...“It’s a cultural thing...they must have tortillas for lunch and dinner, otherwise they feel like they do not eat... traditional Mexican foods such as beans, rice, and tortillas are consumed regularly, and these foods can be found in the local supermarket.”... (personal interview, April 4th , 2006).

According to Migrant Head Start Family Service Liaison, migrant workers choose food based on price and do not purchase fruit and vegetables because of the high prices and perceived low quality:

“...they buy and eat cheap food because they do not have choice... they will eat fresh fruit, cereals, soups, milk, cheese, yogurt, beef, and pork, which are a regular part of the traditional Mexican diet, but sometimes they do not have enough money; and sometimes they cannot afford red meat so they purchase chicken instead... also that they do not eat as many fresh fruits and vegetables

because of the perceived poor quality and high prices...” (personal interview, April 4th , 2006).

The majority of providers commented that the migrant farm workers have increased their consumption of foods from fast-food restaurants and restaurants that have buffets on weekends. Single men in particular are susceptible to this. They usually spend long hours on the farms, returning late in the evening; consequently, most were not familiar with cooking and were entirely dependant upon processed foods, and foods that are quick and easy to prepare such as hot dogs, canned beans, ready-made tortillas, and eggs.

Alternatively, many migrants depend on a woman cooking in the common kitchen. This worked like a restaurant in which the men were served by the woman and paid her after eating. This woman usually cooked rice, beans, and tortillas along with pork, steak, or chicken using traditional Mexican preparation techniques.

Available food is generally purchased from specific stores: Wal-Mart, nearby convenience stores, and the gas station. Interviewees offered many opinions for this, the most common being that Wal-Mart appeared to be trying to meet the food-related needs of the migrant farm workers by carrying traditional foods, salsas, special tortilla flour, and traditional chili peppers that they had not been able to find before. In addition, migrant workers and their families are taken by bus to these establishments. The bus driver drives them from the camp to Wal-Mart and waits for them for about one hour before driving home. Key informants mentioned that typical purchases were: boxes of beer, especially among single males, to a variety of food items for families with kids, including tortillas, beans, rice, tomato paste, chili, chicken and sometimes red meat, ramen soups, sodas, beverages, water, and detergent. The researcher frequently went to

Wal-Mart and, in many instances, was able to interact with migrant parents. When asked if they were able to locate foods that they wanted, they responded that for the most part they were able to find traditional Mexican foods and some Mexican beverages.

In addition, one of the providers said that many migrant workers cannot read food labels because they are in English or because of their inability to read or understand food labels. They also have difficulty identifying foods by their names. Another key informant said that migrant workers are used to helping each other when needed. If a migrant farm worker does not have food to eat, then those who have food share with those who do not.

Finally, interviewees noted that children who were exposed to new foods in schools and nutrition education started to request fruits, vegetables, and other kinds of food at home. Parents who had access to transportation had visited some food banks to try to get their children some of the food requested.

Barriers to health care

Language is one of most common barriers to accessing health services, since many migrant farm workers do not speak English. However, some agencies have bilingual staff. According to the Migrant Clinic provider:

...one of the requirements for doctors and nurses is to speak Spanish as a second language almost 80% of the staff knows how to speak Spanish...however; bilingual doctors are very difficult to find...some of the patients sometimes come with a person who can translate for them. It is important also to hire female bilingual nurses because migrant woman come and they feel more comfortable with a woman translator...(personal interview, April 4th , 2006).

In addition, lack of money and medical and dental insurance often prevents migrant farm workers from needed medical attention. Transportation is also perceived as an obstacle to health care. Although the Beaufort School District provides transportation to migrant families when they need to go to the clinic, it may not be utilized.

Health services available in Beaufort

One of the programs available for migrant families in Beaufort is Migrant Head Start, a non-profit organization that serves migrant and seasonal farm workers who have moved within a 24-month period. The program provides educational services, transportation, nutritional services, referrals, and mental, dental, and general health services. Children from birth to kindergarten are enrolled with their parents. The Migrant Head Start Program in Beaufort provides age-appropriate instruction, nutrition and physical education, dental care and dental education to migrant children and their families. Its principal objectives are to help children learn healthy habits that will help them in adult life and to help parents become accustomed to life in the United States. For example, migrants might be taught how to open a checking account and obtain car insurance.

The Ronald McDonald Care Mobile provides initial screening, diagnosis, primary care treatment, and referral and follow-up for serious dental problems. Doctors from the Ronald McDonald Care Mobile come one week after harvest season and provide dental services to all children at Saint Helena Elementary School. The program provides school exams, routine check-ups, cleanings, x-rays, root canals, emergency pain control, referral services, and education about dental health.

The Migrant Clinic provides family practice, pediatrics, dental care, and laboratory services to migrant farm workers. If migrant farm workers need emergency care, the

Migrant Clinic sends them to Beaufort Memorial Hospital. Approximately 90 percent of the staff is bilingual (English-Spanish). The Migrant Clinic will never deny attention to anyone in need due to lack of funds.

The Saint Francis Church provides free food and clothing as well as information about services available to individuals or families.

Food assistance program participation

All the key informants stated that WIC and Migrant Head Start, and food banks are available for everyone who can meet up the eligibility requirements of these food assistance programs. For example, WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) helps low-income women and their children (from birth to 5 years of age) who are at risk for food insecurity or are food insecure (determined by a competent professional). This program provides food, information on nutrition, and recommendations on health care. However, many migrant farm workers in Beaufort do not utilize the services provided by WIC. One reason why migrant farm worker might not use WIC is because of lack of transportation. In addition, WIC's hours of operation (Monday through Friday from 8 am to 3 pm), do not match with migrant farm workers' working hours.

Another program, the Migrant Head Start provides food, nutrition, physical, and health education. Participants must present documentation that confirms that their parents work in agricultural jobs, that they have moved between states seeking that kind of job in the last 24 months, and that they live under the poverty line. In addition local churches such as St Francis Catholic Church provide groceries through it food bank, and clothing to all people in need, with no questions asked and no documentation required.

Observations of Migrant Camps

Observations of the camps were divided into five areas: 1) overview of camp facilities, 2) dormitories, 3) restrooms and showers, 4) kitchen and dining, and 5) additional observations. Each of these areas will be discussed in detail.

Overview of camp facilities

The camp's buildings were arranged in a rectangle formation with a central courtyard. Each side of the rectangle was composed of a 60-by-10-meter one-story building that housed 12 living units and 20-by-5 meter communal bathrooms at the end. One side of the rectangle was a common kitchen and dining room. In the center courtyard was a large, well-tended garden (in other camps, there was only dry land). The buildings were largely constructed of wood or prefabricated material. The doors were made of thin wood sheets and had no locks. None of the rooms had air conditioning. As a result, the metal ceilings heated during the day by the sun raises the indoor temperature above the outdoor temperature. Some residents had purchased their own portable air conditioners or fans.

Dormitories

Rooms were often carelessly maintained. In many cases, the walls were dirty, the ceilings rusted, and numerous cracks allowed precipitation to seep into the rooms. As a result, many residents had to take precautions to protect their belongings. The dirt and humidity had faded the initial color of the walls, and many walls had inscriptions about religion, poetry, country of origin, family, and favorite soccer teams. The floors were discolored and dirty, and many were cracked and emanated an unpleasant smell. The rooms were of two types: 1) for families (father, mother and generally two or three

children); and 2) for groups of at least ten people, most commonly single males or married males who were living in the US without their families.

The units for families were small and had two twin beds, a sink, and a toilet (this was in one of the camps only, in the others, only communal bathrooms were available). The bed frames were often oxidized by the passing of years and the humidity. The mattresses were very old, dirty, and tainted. In the corner of the room, there was a refrigerator (only in some rooms and only in some camps), and a light bulb in the ceiling provided limited light. There were windows with no screens or sometimes with screens in very poor condition that allowed flies, cockroaches, ants, mosquitoes, and other insects access the room. Some rooms had no windows. Some rooms contained old furniture, such as chairs or tables.

The toilets inside the rooms were old and dirty, with no toilet seat or tank covers. There was no privacy, as they were not enclosed. The sinks, in some cases, were in good condition. In some cases, the electrical connections were precarious and oxidized, with cables dangerously peeled and exposed.

The units intended for at least 10 people were the same dimensions and in the same general condition as the family units, but had three to five bunk beds. These rooms did not have a toilet or sink or any refrigerators.

Many families had electric frying pans, portable burners, or similar appliances so they could cook in their units. Many also had traditional Mexican utensils like a *molcajete* (mortar and pestle), used to crush chili peppers and to make *mass*; a *tortillero* (tortilla press) to flatten the dough to make tortillas; and a large *comal* (cast iron plate or griddle), used to toast tortillas and blister chili peppers. They also had tortilla warmers and plastic

tortilla containers used to keep the tortillas warm during meals. Old and dirty wood cutting boards and fire-blackened cookware were also observed in the rooms as well as in the kitchen. Some units had leftover beans and tortillas or meat sitting out with no refrigeration.

Restrooms and showers

The communal bathrooms were subdivided into indoor toilets and showers and outdoor sinks (under an overhang). Again, the toilets often had no toilet seats and were dirty and smelly; they were separated by thin sheets of wood, and the stalls had no doors.

The common showers had pipes across the ceiling with regularly spaced shower nozzles and levers to turn each nozzle on or off. Some camps had no hot water, but the temperature outside was so high that this appeared to be of little concern. The owner of one migrant camp had renovated the bathrooms, replacing toilets and sinks and installing new fiberglass showers. The sinks were large enough to be used for multiple purposes, including washing laundry.

Kitchen and dining areas

The common kitchen and dining area included six gas stoves, each with four burners, and one large gas oven in very good condition. Next to this was a large receptacle for trash, a food preparation table, and three sink. There was neither refrigeration nor storage space at the common kitchen. Appliances, cookware, cooking utensils, plates, or silverware were not observed in the first visit (when the migrant farm workers had not yet arrived). However at following visits, these items and as well as some Mexican utensils (mortar and pestle, tortilla press, and griddle) were observed. Since some of the migrant farm workers depended on a woman that cooked for them all these items probably

belonged to her. And almost certainly this woman may have refrigeration in her room, in which she probably stocks the food as well as appliances, cookware, etc. The surplus space was filled with long tables with long benches. The walls were greasy and covered with flies.

Additional observations

None of the facilities had smoke detectors, despite the risk of fire due to cramped quarters, frequent smoking, the old wooden construction, and the greasy walls. Men often lay down to rest in the courtyard in the middle of camp after returning from work in the field, often with cans of beer in their hands, talking and listening to Mexican music.

The access roads to the camps were not paved and were in poor condition, with many potholes. Sometimes the irrigation channels would overflow from backup or rain, and cars or buses could become stuck in the mud or in the ditches.

Life seemed to pass slowly for the women who did not work in the field and for others who stayed at camp while their husbands or other family members were working. Many dedicated their time to cleaning the common areas, doing laundry, or watching children. The children who did not go to Migrant Head Start did not appear to receive the same level of care as they would have received if they had been at Head Start. The migrant farm workers with children usually had to wait for two buses—one from the school that picked their children up at 6:00 a.m. and returned them home at 6:00 p.m. and the other that picked the workers up to deliver them to and from the tomato fields. Some fields had security guards; others did not. Some camps could be entered without any difficulty while others required identification. The researcher learned that the lack of

security led to numerous robberies, usually orchestrated by non-residents coming into the camps.

Records Review

The Migrant Head Start office provided access to the children's records for review. A 45-item questionnaire must be completed by the parent at the time of the enrollment. This survey includes the child's clinical history and included items such as weight and length at birth, current weight and height, allergies, pesticide exposure, and childhood diseases. Twenty-one items from each child were reviewed. These results are presented in Table 1.2 (Appendix 1).

Most notable is that the majority of the children were physically healthy. None of the children were using medication, except for colds or coughs. In addition, none were reported to suffer from heart problems, chicken pox, meningitis, frequent headaches, rheumatic fever, chronic high fever, joint pain, anemia, intestinal parasites, or seizures. None had difficulties swallowing or with choking easily. Only 14.3 percent indicated problems with teeth or gums. All screened negative for TB, and none reported food allergies.

About 14.3 percent of the children presented at least one of the following health problems: frequent diarrhea, constipation, chronic stomach pain, bladder infections, dermatitis, eczema, ear infections, trouble breathing, and asthma. Only one child had delayed speech. Approximately 90 percent of all children had never been tested for lead.

At the beginning of the program, height and weight were recorded for all children. These measurements were used to compute the Body Mass Index (BMI). The percentile indicates the relative position of the child's BMI number among children of the same sex

and age (Center of Disease Control and Prevention, 2006). The BMI results of the migrant children at Saint Helena School indicated that 38.1 percent of the children were considering being at risk of overweight (BMI in the 85-94 percentiles for age); 19.1 percent were overweight (BMI greater than 95 percentile); and 42.9 percent were at a healthy weight. All the children had normal reported birth weights. The growth charts (Appendix 8) show the weight status categories used with children and teens (underweight, healthy weight, at risk of overweight, and overweight).

Analysis of the menus served at Migrant Head Start

As discussed earlier, the nutrients analyzed included protein, total carbohydrates, total fat, saturated fat, polyunsaturated and monounsaturated fats, cholesterol, vitamins (A, B₁, B₂, B₃, B₆, B₁₂, Biotin, C, and D), calcium, iron, magnesium, phosphorus, potassium, sodium, and zinc. The results of the 19-day menus are reported in Table 1.3 (Appendix 1).

The means of each item measured are as follow: total calories, 1635 kcal; protein, 67 grams; carbohydrates, 225 grams; fat, 53 grams; saturated fat, 17.84 grams; monounsaturated fat, 17.89 grams; polyunsaturated fat , 8.41 grams; trans fatty acid, none; and cholesterol, 200.13 milligrams.

For the vitamins, the following means were calculated: vitamin A, 4803 (IU); B₁, 1.034 milligrams; vitamin B₂, 0.9689 milligrams; vitamin B₃, 10.67 milligrams; vitamin B₆, 0.81 milligrams; vitamin B₁₂, 1.57 micrograms; Biotin, 1.9 micrograms; vitamin C, 105.24 milligrams; vitamin D 244.08 (IU); and folate, 235 micrograms.

The means for additional vitamins and minerals are: pantothenic acid, 1.68 milligrams; calcium, 1097.954 milligrams; iron, 9.52 milligrams; magnesium, 108.44

milligrams; phosphorus, 539.28 milligrams; potassium, 1234.22 milligrams; sodium, 2901.42 milligrams; and zinc, 4.14 milligrams.

Migrant Head Start provides three meals a day to all children enrolled in the program. This food must meet the nutritional requirements for children as defined by USDA. Milk was offered three times a day (breakfast, lunch, and dinner). However, it was observed that almost all the milk boxes were not consumed during the lunch meal. Consuming milk during the lunch meal may not be not culturally suitable for Mexicans (American Dietetic Association, 1999; Romero-Gwyn et al., 1992; Pareo-Tubbeh et al., 1999; Delpapa et al., 1990).

Although the Head Start program patterns meals after the dietary guidelines, this does not guarantee reliable dietary quality. After the analysis of the menus served at the Migrant Head Start in Beaufort, the mean amount of daily calories—1635 kcal—was slightly elevated compared with the requirement of 1600 calories recommended by the USDA. Mean values for protein was 67 grams (50 grams recommended from Dietary Guidelines) and carbohydrates were 225 grams (130 grams recommended from Dietary Guidelines) were also high and did not reflect the implementation of the recommendations of the dietary guidelines.

In addition, the high sodium content of the menus is of concern. The mean value for sodium was 2901 milligrams a day (45 percent more than recommended). Although sodium content in fresh, unprocessed food is very low, the food served at the Head Start in Beaufort has a high sodium content. This may be as a result of using certain processed foods such as some canned vegetables, ready-to-eat cereals, or processed cheeses.

Some of the foods served at the Migrant Head Start included pizza, fried chicken, quesadillas, macaroni and cheese, cheeseburgers, and scrambled eggs with bacon. Even though the researcher did not observe the method of preparation, food served at the school appeared to be greasy and unappetizing. Moreover, a study conducted at a Head Start in New York found that the intake of total fat, saturated fat, and cholesterol exceeded recommendations and that during school hours children consumed up to 25 percent of the daily recommendation for energy and nutrients (Bollella et al., 1999).

However, the menu analysis of the menus at Migrant Head Start in Beaufort indicated that the mean fat level did not exceed the recommendation. Saturated fat, monounsaturated fat, and polyunsaturated fat were in normal range (less than 20 milligrams). Nevertheless, the cholesterol content (200 milligrams) was higher than recommended (<170 milligrams). An elevated cholesterol level in blood is a risk factor for coronary heart disease in adults, but some children may be at risk for early coronary heart disease if they have high cholesterol blood levels earlier in life (American Heart Association, 2006).

Vitamins A, C, and D and the minerals calcium, iron, and zinc are key nutrients required for normal growth and development for the prevention of anemia (Whitney & Rolfes, 2005); these were all found at acceptable levels. Biotin (used in cell growth, the production of fatty acids, metabolism of fats, and amino acids) and pantothenic acid (essential for growth, reproduction, and normal physiological functions) were low in content (Whitney & Rolfes, 2005). The menus were significantly low in magnesium. Magnesium deficiency may cause high blood pressure, heart problems in adults; and

insomnia, anxieties, chronic constipation, and hyperactivity, particularly in children (Whitney & Rolfes, 2005).

Part 2

Intervention population

Twenty-one children (10 boys and 11 girls, from 3 to 5 years of age) were enrolled by the Migrant Head Start Program at Saint Helena Early Learning Center in Beaufort County, South Carolina. All were of Mexican origin and spoke Spanish, but only 11 spoke English as a second language. Only one of the 21 children had a speech delay.

Fifty-seven percent of the children were 3 years old, 24 percent were 4 years old, and 19 percent were 5 years old; the children were divided into two classrooms—3-to-4 year olds and 5 year olds. Table 1.4 (Appendix 1) summarizes the demographic information.

Baseline nutrition, food safety, and physical activity

The 31 pre- and posttest questions on knowledge and behavior and the children's respective answers are presented in Tables 1.5 and Table 1.6 (Appendix 1).

The levels of knowledge varied significantly by item, as the children did not perform equally across the questions. All children initially responded incorrectly to the following questions: K1) what is the healthiest snack choice among a list of items; K2) among the following, which is a low-fat snack: pretzels, potato chips, or doughnuts; K4) how many servings of vegetables are needed each day; and K5) how many servings of fruits are needed each day. Only 2 of 21 (9.5 percent) could identify a healthy lunch. Only one could identify calcium as being the most important nutrient in the milk group. Three children (14.3 percent) correctly selected orange juice as the healthiest drink from a list, and three were able to select the healthiest lunch from a list.

The children performed better with respect to handwashing: 57.1 percent knew to wash their hands after playing with a dog; 81 percent knew to wash their hands after using the toilet; and 57.1 percent knew to wash hands before meals. Only one child knew how long they should wash their hands before touching or eating food. With respect to food safety, 33.3 percent knew to throw spoiled food in the trash can, and 19 percent could identify which food would always be safe to pack in a sack lunch. Only two knew why they need to wash fruits and vegetables before eating them. Only one knew why food that is left out for more than two hours might be unsafe. A slight majority (57.1 percent) reported that the first thing they would do in the process of making a sandwich would be to get meat from the refrigerator; and 42.9 percent said to take out the bread; none of the respondents stated they would wash their hands before making a sandwich.

On the other hand, 52.4 percent said they did not consume different kinds of fruits, and 47.6 percent eat fruit only on some days; 71.4 percent reported eating vegetables “not very often” and “not very often at lunch or dinner.” Nineteen reported not having fruit or fruit juice for breakfast, while the remaining 9.5 percent did not know if they did or not. Nineteen children (90.5 percent) answered that they drink milk or eat cheese at least once, on some days. Conversely, 100 percent of the children responded that they eat candy or chips every day. Sixteen children (76.2 percent) answered that they eat breakfast everyday. Eleven of 21 (52.4 percent) did not like to try new foods very often, and 47.6 percent only “sometimes” liked to try new foods. Before the program, 14.3 percent and 71.4 percent responded that they were physically active, always and sometimes, respectively.

Post-intervention nutrition, food safety and physical activity

After completing the six-week program, 100 percent of the children knew the healthiest snack choice; 85.7 percent correctly recognized the low-fat snack; 81 percent could identify the healthiest lunch; 81 percent knew how many servings of vegetables are needed each day; 66.7 percent knew how many servings of fruits are needed each day; and 76.2 percent correctly identified the healthiest drink. However, only two (up from one) could identify calcium as being the most important nutrient in the milk group.

With respect to handwashing, all children knew to wash their hands after playing with a dog, after using the toilet, and before meals; 52.4 percent indicated they “always” washed their hands before touching or eating food, and 47.6 percent “sometimes.” All the children knew to throw spoiled food in the trash can; 90.5 percent correctly identified the food that always would be safe to pack in a snack lunch. Nineteen of 21 children knew to wash their hands at least for 20 seconds before touching or eating food; 92.5 percent knew why they need to wash fruits and vegetables before eating them and why food left out for more than two hours might be unsafe, and 90.5 percent indicated they would wash their hands before preparing a sandwich.

With respect to actual eating practices, all reported eating vegetables at lunch and/or dinner. About half (53.4 percent) reported having fruit or fruit juice for breakfast, whereas 47.6 percent still did not. Twenty children (95.4 percent) answered that they drink milk or eat cheese at least once on some days. The daily consumption of candy or chips dropped from 100 percent to 81 percent. Seventeen children (81 percent) answered that they were eating breakfast everyday. About one in four (23.8 percent) “always” like to try new foods, and 76.2 percent said they “sometimes” like to try new foods. After the

program, 81 percent and 19 percent reported that they are physically active "every day" and "sometimes," respectively. Comparisons of the Behavioral questions charts between Pre and Post Behavioral Results are showed in Appendix 9.

The children were separated in two groups: 1) 9 older children (4 to 5 years old) and 2) 12 younger children (3 years old). Multiplying the number of children in each group (older and younger groups) with the number of questions of the knowledge questions resulted in the total number of questions each group answered correctly for both the pre- and posttest. The next table shows the pre and post test knowledge question results of older and younger children.

Table 3.1 Older & Younger children Pre & Post Test knowledge questions Results

	Older Children (n=9)		Younger Children (n=12)	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Knowledge Questions	21.60%	88.89%	19.91%	85.64%

The older children responded correctly 35 of 162 possible times (21.6 percent) in the pretest, while the younger children answered correctly 43 of 216 times (19.9 percent). On the posttest, the older children performed better than the younger children, answering correctly 144 of 162 possible (88.9 percent) to the younger children's 185 of 216 possible (85.6 percent). The percentage improvement was comparable in both groups.

Food Guide Pyramid results

The results of the Food Guide Pyramid questions are presented in Table 1.7 (Appendix 1). The results of the pre-test indicate that 100 percent of the children responded that they do not know the Food Guide Pyramid (before exposure to nutrition

classes); thus, all subsequent questions were skipped, assuming respondents were unable to know the correct answers. However, this assumption, in hindsight, was most likely not correct, since children might have been able to recognize some of the questions of the Food Guide Pyramid such as food groups. For this reason before and after comparisons could not be taken. The question number P12 (“How many servings of milk, yogurt, and cheese should be eaten each day?”) was the only exception to this; it was tested, and children responded correctly in 28.57 percent of the total (n=21).

The results are optimistic if we assume that children started with no knowledge about the Food Guide Pyramid. The posttest results indicate that all of the children recognized the Food Guide Pyramid and knew what the pyramid is about (“How much should be eaten of different kinds of food”). In addition, 95 percent of the children could recognize what group goes at the bottom and what group goes at the top of the pyramid, and 52 percent could recognize all the groups from the Food Guide Pyramid. In questions in which respondents had to circle three correct food pictures from groups of six to indicate a certain group, 57 percent recognized the three pictures from the grains group, 85 percent recognized the three pictures from the vegetable group, and 90 percent recognized the three pictures of the dairy group. Eighty-five percent knew that eggs correspond to the meat group (protein). Food Guide Pyramid post-test results chart is shown in Appendix 10. These data suggest that the Food Guide Pyramid is understandable even to very young children.

The data from children were separated into two groups as was done with the knowledge questions. Multiplying the number of children in each group (older and younger groups) with the number of questions of the Food Guide Pyramid questions

resulted in the total number of questions each group answered correctly for both the pre- and posttest. Older children performed better than younger children in responding to the Food Guide Pyramid questions. The table on the next page shows the pre and post test Food Guide Pyramid question results of older and younger children.

Table 3.2 Older & Younger children Pre & Post Food Guide Pyramid Results

	Older Children (n=9)		Younger Children (n=12)	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Food Pyramid Questions	0%	94.44%	0%	84.03%

On the Food Guide Pyramid posttest, older children answered correctly 102 of 108 times (94.4 percent) while younger children answered correctly 121 of 144 times (84.0 percent).

CHAPTER 4: DISCUSSION SUMMARY AND LIMITATIONS

Part 1

Key informant and observations

Key informant interviews are used to obtain integral information about a specific population through questions about particular problems providing the “how’s and why’s” of specific problems (USAID, 1996). These individuals have unique knowledge acquired through the years of working with the target audience (Afonja, 1992; Berggren & Mtimuni, 1992; Gilchrist, 1992; Lengerler et al., 1991; Lilli-Blanton & Hoffman, 1995; Yadrick et al., 2001). The direct information, obtained from key informants, makes available the target audience’s needs.

Demographic composition of the migrant farm worker population

According to the key informants, migrant farm workers are 30 years old on average and have an annual income less than 10,000 dollars. Eighty percent of the migrant farm workers are males, and 20 percent are females who typically work in the packaging houses; however, a few females also work in the fields. Eighty percent of the migrant farm workers are of Mexican origin; the rest come from Haiti and Central America. The demographics of the population in this study are similar to findings in many studies from different parts of United States (U.S. Department of Labor, 1999; U.S. Department of Health and Human Services, 1990; NAWS, 1999).

The population of Hispanics in Beaufort, South Carolina, has been growing over the past decade. It seems that many migrant farm workers are not migrating, preferring to stay in Beaufort and look for temporary employment during the year. When the agricultural

season begins, they return to the fields to work in the harvest season or in the packaging houses. The preferred temporary jobs are construction, landscape, and painting.

The key informants stated that approximately 85 percent of the migrant farm workers did not have medical or dental insurance—a number that coincides with the National Agriculture Workers Survey (NAWS), which held that 85 percent of migrant and season farm workers are completely uninsured (NAWS, 1999; USDHHS, 2000; U.S. Department of Labor, 2002).

Work associated environmental hazards

The long exposure to sunlight and high temperatures results in skin burns that could eventually turn into skin cancer. Migrants often do not use sun block because they are unaware of the risk or have no money to buy it. In addition, they suffer back pain and muscular pain due to the constant lifting of buckets full of fruits and vegetables. Such work-related injuries are avoidable, but migrants must be informed of prevention techniques. The use of back support belts and training on the best way to lift the buckets may help alleviate this problem.

One area of concern for the migrants who work in the fields is the potential for exposure to pesticides. The apparent lack of training in pesticide use and the lack of use of protective equipment (clothes, goggles, etc.) could put these workers at greater risk for developing skin cancer, eye damage, dermatitis, skin disease, skin discoloration, and respiratory problems (Arcury et al., 2003; Lantz et al., 1994; Murphy-Greene, 2002; Shipp et al., 2005; McCauley et al., 2004; Hogan & Lane, 1986; O'Malley & Mathias, 1998; Villarejo & Baron, 1999). Even worse, the children of these workers are at risk too (Shipp, 2005). Often migrant farm workers do not immediately change their clothes when

they return to camp. These clothes remain covered with the pesticide (McCauley et al., 2004, Murphy-Greene, 2002); as workers spend time with their families, this pesticide residue can spread to others. In addition, many workers do not wash their “work clothes” since they must wear the same clothes the next day (Shipp et al., 2005; McCauley et al., 2004; Lantz et al., 1994).

When pesticides come in direct contact with the skin or eyes, it can lead to burns and insufferable itching (Arcury et al., 2003; Murphy-Greene, 2002); sometimes the skin even starts to peel. Left unchecked, pesticide in the eyes can lead to vision loss. In either case, migrants must be evacuated to the migrant clinic for first aid, resulting in a fee, as mentioned previously. Prolonged exposure to pesticides causes many types of cancer, most commonly skin cancer (Arcury et al., 2003), as well as skin discoloration, particularly in the hands and arms (Arcury et al., 2003; Murphy-Greene, 2002; Gamsky et al., 1992).

Some migrant families who did not use the common kitchen had portable kitchens in their rooms that they used to prepare their meals. Thus the potential for contamination of food products with pesticide residue exists. Also, the researcher observed a lack of smoke detectors and fire extinguishers in the camps. Both items are relatively inexpensive and could save many lives as well as financial loss should the camp catch on fire.

Nutrition summary and barriers to achieving good nutrition

This study indicated that nutrition-related problems caused by unhealthful eating habits are abundant among this population. These findings are similar to what others have found (Lantz et al., 1994; ACS, 2000; HHANES, 2004). Such problems are a concern among the Hispanic population, but they are even worse among the migrant farm

worker population. Overweight, obesity and diabetes are the most common nutrition problems among migrant families (Nicklas et al., 2003; American Dietetic Association, 2004; Obesity Still on the Rise, 2002; Hedley et al., 2002; Troiano, 1995; Pareo-Tubbeh et al., 1999; U.S. Department of Health and Human Services, 1996; Mokdad et al., 1999; AOA, 2002; Mei et al., 1998; Slesinger, 1992; Dever, 1991; Migrant Clinicians Network, 1991; Troiano & Flegal, 1998). In spite of the fact that these men and women work all day and remain quite physically active, the excess of unhealthful food often rich in fats (Birch et al., 1995), proteins, and carbohydrates puts migrant farm workers at risk for other nutrition-related diseases. Additional risk may be due to undernutrition of needed vitamins and minerals as a result of a lack of fruit and vegetables.

During the current study, a woman was observed preparing food for the male migrant farm workers during the week. It seems that the migrant farm workers were eating only once a day because they spend the whole day working. As a result, they tended to load up on food during this single meal so it would last until the next meal.

As with other studies (Olson & Holben, 2002; Gurthrie & Nord, 2002; Drewnowski & Specter, 2004), lack of money was found to significantly affect the nutritional intake and food security of migrant workers. For example, fast food consumption among migrant farm workers is very high (Bowman et al., 2004a; Bowman et al., 2004b; Paeratakul, 2003) as pizza, hamburgers, and chicken from such establishments are affordable solutions for meals, particularly for single men or men whose families are in their home countries. The key informants indicated that this situation and lack of funds encourage migrant farm workers to purchase unhealthful food, choosing quantity over quality. This is consistent with what others have found (Melgar-Quinonez et al., 2003).

Language, lack of refrigeration, lack of transportation, as well as alcohol consumption were all cited as barriers to adequate nutrition. These findings are consistent with what others have found (Lantz et al., 1994; McArthur et al., 2001; Sullivan, 2003; Satia et al., 2005; Slesinger, 1992; McKenna, 1989; Weather, 2004; Wilkinson,1994; McDermott and Lee, 1990).

Finally, key informants in this study and several researchers (Jukes, 2005; Rivera et al., 2004; Perez-Rodrigo & Aranceta, 2001; Kaiser et al., 2002; Clark, 2006; Passehl et al., 2004; Gottesman, 2003) agree that nutrition education is the only way to prevent nutritional problems among migrant farm workers. For example, many workers are not accustomed to eating vegetables, green salads, or fruit since these items can be very expensive (Neuhouser et al., 2004) or are perceived as very expensive. Nutrition-related education could teach these workers how to economically meet their nutritional needs. However, it is very hard to change adult behavior in food-related matters; thus, early nutrition education is ideal as it will help children establish healthy habits that will help them have a healthier adult life (Jukes, 2005; Rivera et al., 2004; Kaiser et al., 2002; Clark, 2006; Passehl et al., 2004; & Gottesman, 2003).

Barriers to health care

Migrant farm workers have less access to medical care than any other ethnic groups (Statistical Abstract of the US, 2005). An alliance between the government, the Migrant Clinic or healthcare provider, and the farm owner may be established in order to give migrant farm workers reduced fees and free medicines.

In addition, even though the key informants stated that the majority of clinic staff speak Spanish, by observation, the researcher believes that many of the staff are not

fluent. It is very difficult to find truly fluent bilingual staff for seasonal jobs. Thus, it is recommended that these clinics employ full-time interpreters or available or provide access to interpreter services through the telephone. Having interpreters available from both sexes ensures that both male and female workers will have access to healthcare.

Food assistance program participation

One issue facing migrant workers who seek food assistance is their lack of documentation, which does not allow them access to some food assistance programs. In addition, a fear of deportation as well as a lack of time and transportation may prevent migrant workers from accessing these programs. Although some of the children of the migrant farm workers are American citizens and can use such programs, they do not seem to know about the existence of these kinds of programs. This general lack of knowledge may serve as a significant barrier to food assistance for the migrant worker's family. It is important that migrant farm workers be made aware about food assistance programs they can access.

Review of the Head Start records

In reviewing the Head Start records, it appeared that the children did not have health issues such as heart problems, chicken pox, meningitis, frequent headaches, rheumatic fever, chronic high fever, joint pain, anemia, food allergies, intestinal parasites, or seizures. However, parents' responses could be the result of an ignorance of the diseases. In addition, since they cannot afford healthcare in general, it is possible that these conditions exist in the children but have not been diagnosed. The common health problems in children in the Head Start program in Beaufort were frequent diarrhea, constipation, chronic stomach pain, bladder infections, dermatitis, eczema, ear infections,

trouble breathing, asthma, and runny noses; similar health problems were found in many studies and statistics in the United States (Slesinger & Ofstead, 1993; Dwyer et al., 1995; Martorell et al., 2000). Only 14.3 percent of the migrant children in Beaufort indicated problems with teeth or gums; such low rates could be the result of programs and organizations that provide dental care to migrant children, such as the Ronald McDonald Dental Care Mobile.

Another important issue was that 90 percent of the children had never been tested for lead. Exposure to lead may cause damage to the kidneys, nervous system, and brain in both children and adults (Rabinowitz et al., 1980). Nutrition is related to lead poisoning, because appropriate nutrition is vital in the prevention of lead poisoning, particularly in young children. Including grains, fruits, vegetables, dairy products and selections from meat, poultry, fish, dry beans, nuts or eggs, in a properly balanced diet, can help reduce the risk to lead intoxication. It is very important to include adequate amounts of calcium and iron (Pearse & Mitchell, 2003). Lead absorption is increased in a fasting condition—that is why children must eat breakfast, regular meals, and snacks (Rabinowitz, 1986). The recommendation is to have at least two lead tests for all migrant children between the ages of birth and 6 years: one at 1 year of age and the second one at age 2. It would be important for migrant parents to have the information about recognition and prevention of lead poisoning and to be made aware of the potential magnitude of this problem (Schaffer et al., 1996; Piomelli, 2002).

Height and weight were recorded for all children, and the BMIs calculated. More than 57 percent of the migrant children were between the 85th and 95th percentiles for their age; in other words, they are at risk of being overweight or they are already overweight.

In comparing these results with the National Survey of Children's Health (NSCH) 2003 statistics of children at risk or overweight or are overweight (30.5%), it was found that the prevalence of overweight among the migrant children in Beaufort is higher than national levels (NSCH, 2003). This is an important consideration because being overweight in childhood is significantly associated with being overweight in adult life. One study found that overweight young children from 2 to 5 years of age were more than 4 times as likely to become overweight adults as those with BMI for age below the 50th percentile (Freedman et al., 2005).

Analysis of the menus served at Migrant Head Start

In the analysis of the menus the mean amount of calories, protein, and carbohydrate were slightly higher than recommended. In addition, sodium content of the menus was 2901 milligrams a day (45 percent more than recommended). The mean fat (saturated, monounsaturated, and polyunsaturated fat) level did not exceed the recommendation. However, cholesterol content was higher than recommended. Vitamins A, C, and D and the minerals calcium, iron, and zinc were all found at adequate levels. Biotin and panthothenic acid's contents were low. The menus were also low in magnesium.

The result in this study may not reflect the real situation in Beaufort nor in other locations; because the food analysis was based only on one menu sample of one summer month, plus only the Head Start in Beaufort was tested, and the methods of food preparation were not known. In addition, a nutrient analysis of individual food intake was not assessed.

Part 2

Baseline and post-intervention nutrition, food safety and physical activity

Although the current program lasted only six weeks, the migrant children that received the intervention showed some improvement in knowledge and changes in behavior. It is important to note that this questionnaire was not tested for reliability and validity, beyond an initial face validity test by faculty and students in the area of food science and human nutrition. In addition, although children maintained the desired behavioral changes in the nutritional education setting for six weeks, such changes were not necessarily permanent, indicating the need of a follow up study to determine knowledge and behavior change. Many researchers agree the best way to change behaviors is through long-term nutritional education interventions (Westenhoefer, 2001; Foster et al., 2004), therefore continued educational efforts with this group would be beneficial.

Statistically significant differences were seen in total scores between pre- and posttests, indicating an increase in knowledge and skills as a result of the training sessions. Knowledge is often seen as a necessary, but not sufficient condition for behavioral change. This may be particularly true for behavioral skills-related knowledge. Parents could recognize some improvement in their children, who began requesting foods that they did not traditionally eat. However, this finding may reflect a short-term response to the intervention. Incorporating food preparation into the general intervention helped children to learn basic techniques. The cooking classes, visits with Mr. Tooth, the Food Guide Pyramid Game, and handwashing exercises all appeared to be popular with the children. These seemed to be effective interventions in producing significant knowledge

gains among children in the topic areas of food safety, food preparation, and nutrition. The overall significance of each of these individually upon the results is somewhat limited because of the lack of a control group to provide explanation for gain in knowledge and skills scores as well as due to the small sample size. However, the increase in knowledge, as reflected by improved total scores, can still be considered as a program success.

The results of this study cannot be generalized because the children were not randomly chosen and may not have been representative of the Hispanics in the community or Hispanic populations in other areas. Nevertheless, migrant children in other communities may have similar nutrition education needs as children in Beaufort, South Carolina.

Food Guide Pyramid Intervention

One hundred percent of the children responded that they did not know the Food Guide Pyramid before exposure to nutrition classes; as a result all subsequent questions were skipped (except question 12 as indicated earlier), assuming they would not know the answers.

Nevertheless, the posttest results are encouraging. All of the children could recognize the Food Guide Pyramid and what it means by the end of the study. Sixty-six percent could identify all groups of the pyramid. These results may be due to the use of many graphics, such as the six-foot tall Food Guide Pyramid and colorful pictures. However, the six-foot tall pyramid was not used with children at the posttest, which may explain the discrepancy in posttest scores between the older and younger children; younger children might perform better if it were used. It is important to note that the retention capacity of

younger children is less than older children. In the end, 95 percent of both age groups could recognize the groups from the top and the bottom of the Food Guide Pyramid; at this age they could recognize and associate things with “up and down.” They also did well recognizing foods from each group, and more than half (52 percent) of the children could identify how many servings of the groups they should eat.

Finally, the CMH curriculum seems to be an effective tool for teaching children about healthy eating behaviors. A relation was found between correct answers and age groups. Older children performed better than younger children on both the pre- and posttest of the knowledge and Food Guide Pyramid questions.

Limitations

Although this study provided useful information, it also had several limitations. First of all, key informant interviews have their limitations. Built-in favoritism may perhaps result in an interpretation that does not correspond to the needs of the migrant population as a whole, but instead only those needs which are in the area of the knowledge of the providers. An effort to overcome this was made by interviewing representatives as of a wide variety of agencies, each of whom provides a distinctive service (Warheit, Bell, and Schwab, 1984).

Secondly, the small intervention sample size (n=21) was not representative of the migrant child population, in general. Third, it was not clear whether the children—especially the younger ones (three-year-olds) completely understood the entire questionnaire. The questionnaire was quite extensive (43 questions), and many children lost focus and interest when there were no pictures for the question. In addition, even though the survey questions were acquired from previously validated surveys, it was not

thoroughly tested for validity and reliability with this audience. Fourth, there was no synchronization between the researcher and the teachers; since no approved schedule existed for the intervention, certain teachers did not cooperate at times to let the children go to the intervention. Fifth, the short duration of the study may have limited the impact or longevity of the behavioral changes of the migrant children. Sixth, the assumption made by the researcher in relation to children not knowing about Food Guide Pyramid groups was a strong limitation, because children may were able to know the correct answer of the food guide pyramid part. Seventh, a limitation in the menu analysis part was the issue that recipes and preparation methods were not provided by the Head Start program. Therefore, it was impossible to get a completely accurate analysis.

Despite these limitations, the study provides useful information that can inform researchers and practitioners who work with this audience. In addition, the results of the intervention with migrant children were positive in nutrition, food safety, and food pyramid knowledge gain.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Part 1

Exploratory Study

This study utilized key informant interviews, observations, and review of Migrant Head Start records, and Head Start Program menu analysis to obtain information about migrant farm workers and their children in Beaufort County in South Carolina.

The findings from this study indicate that most of the families are of Mexican origin and speak mainly Spanish. According to the key informants the lack of health and dental insurance is a tremendous health barrier for migrant farm workers in order to improve their nutrition and health problems. Also key informants agreed that obesity and diabetes are among the most common nutrition related health problems among migrant farm workers in Beaufort; and critical barriers such as lack of transportation, lack of refrigeration, lack of language skills, lack of money, lack of education, and lack of health insurance make it difficult to achieve adequate nutrition and good health. Lack of money was found to significantly affect the nutritional status and food security of migrant workers, however this sometimes is a matter of choice since they usually send part of their money earned to their families at their country of origin. It is perceived that fast food consumption among migrant farm workers in Beaufort was high, and that quantity of food was often chosen over quality. Key informants in this study reported nutrition education is an important strategy to help prevent nutritional problems among migrant farm workers.

In addition, unhealthy and precarious living conditions were documented in the course of observations at migrant camps; making even worse any attempt to reach a healthy and acceptable normal life.

The review of records revealed a high number of overweight children at the Migrant Head Start. Although changes in menu planning to make foods more culturally-appropriate and lower in sodium, the menus appear to meet the USDA and Child and Adult Care Food Program meal pattern requirements.

Part 2

Pilot Intervention

The results of the pilot intervention indicate that children under the age of 4 may not be able to understand nutrition-related concepts such as the Food Guide Pyramid. Education for children below 4 years of age needs to be simplified and focused on basic concepts of identification and where food comes from. It appeared that the hand-washing intervention, cooking class intervention, and Food Guide Pyramid interventions conducted with the migrant children in Beaufort were the interventions that have more memorable and positive impact on the migrant children. In addition, the Color Me Healthy curriculum also appeared to be an effective tool for teaching children about healthy eating behaviors.

The teaching style and personality of the educator delivering the intervention was positively received by the children.

Recommendations

Migrant farm workers

Migrant farm workers are at risk for numerous health problems. They spend long hours working at the fields, so they are very hard to reach with nutrition and health-related information and services. In addition, they may not trust strangers, and their inability to speak English makes communication difficult. The migrant workers often receive nutrition and health information in Spanish in the form of brochures, publications, and magazines. However, many migrant farm workers do not read this information because of limited literacy skills, time constraints, or because the format and content of the information provided is unappealing and may not be culturally appropriate.

Recommendations for health, nutrition education programs

The study findings indicate a need for culturally appropriate health and nutrition education, focusing on how to prepare healthy, nutritious, and inexpensive meals as diet-related disease risk reduction:

1. Develop and utilize methods to contact and recruit migrant farm workers and families into the educational programs. Contacting the crew leaders can be useful, because they can provide insight on how to best reach the migrant farm workers in their crew. Secondly, public service announcements on the radio may be utilized to increase awareness about the programs. Migrant farm workers listen to the radio while they are working in the fields or in the packaging houses. In addition, contact could be made with the migrants prior to arriving in the state. For example, contact could be made with the migrants when they are in Florida two or three weeks prior to migrating to South Carolina. Another time to establish contact with migrant farm

workers is upon their arrival at the migrant camps (with the farm owner's consent). It is very important that the people assigned to recruitment speak Spanish, dress casually, and show respect. While printed materials (fliers or brochures, photo-novellas, magazines, newsletters, and Spanish-language newspapers) appear to be good ways to reach migrant farm workers, effort to make these materials culturally and literacy appropriate are needed. Printed media could be distributed in migrant camps, fields, packing houses, migrant clinics, supermarkets or grocery stores, and churches.

2. Develop and implement educational programs that are culturally appropriate.

From observations made in this study four groups were identified that could be targeted for nutrition education: 1) men, 2) parents with children, 3) women that stay at the camps, and 4) preschool children. Since the migrant farm workers do not work on weekends, Saturday or Sunday might be the best time to conduct an intervention. Some of the seminar topics that might be useful are: 1) nutrition and physical activity using MyPyramid, 2) nutrition-related disease (obesity, diabetes), 3) reading food labels, 4) safe food preparation and handwashing, 5) dangers of exposure to lead and pesticides, and 6) canned vs. fresh food. All of the reading materials distributed in these seminars should be in Spanish and with a low reading level. Creating and using photo-novellas (stories in photograph form, or a combination of photographs and text) to present these topics is a worthwhile way to encourage migrant farm workers to reread the information (Quinn et al., 2006; James et al., 2005). However, it might be important to conduct similar seminars or activities with the women who stay in the migrant camps. Since these women are in the camps all week, the seminars could be

held on weekdays. Children enrolled in the Migrant Head Start program in Beaufort spend Monday through Friday in the program, making it the best place to intervene. Interventions about MyPyramid, physical activity, food safety, and hand-washing are the topics to be conducted in order to give them the knowledge to develop healthy habits. Another strategy to help migrant farm workers might be health fairs, in which a group of health care providers give free medical attention, information about health, etc, at the migrant camps on weekends. The workers will take advantage of free medical attention (including lead test for children, AIDS test, diabetes screening, etc), and dental exams, prophylaxis, and treatments. Nutrition education that involves food preparation and tasting might also be conducted during the health fairs. Cooking classes for migrant farm workers might be also a beneficial intervention. Knowing the lack of refrigeration in camp housing and the inability to get rides to and from supermarkets, a class teaching the migrant farm workers how to prepare meals from canned and fresh food would be very useful for them. Recreational activities, gifts, and free food and beverages might be the best way to increase attendance in all of the interventions.

3. Employ bilingual educators who are indigenous to the farm worker community.

There is a tremendous need for bilingual teachers and employees in public service organizations and schools. Translators are also needed in clinics, as health care providers, and in supermarkets. Ideally, both male and female translators should be employed.

Information Systems

There is insufficient information which is readily available to develop specific recommendations on migrant farm workers. Data obtained from this study provides improved understanding of the nutrition and health context of the migrant farm worker population in Beaufort, South Carolina. It is clear that more coordinated information is needed for future studies and recommendations.

1. Create an ongoing assessment of health and nutrition-related issues of migrant farm workers and family members.
2. Conduct additional research, which includes data on the physical, mental and behavioral health and social context of migrant farm workers.

Collaborative Services

There are a substantial number of collaborative services already in place for migrant farm workers. It is important to expand and enhance these services, as well as increase awareness of and access to these services within the migrant community.

1. Establish and support local migrant farm worker service provider committees with the goal of fostering and facilitating inter-disciplinary collaborative connections and partnerships.
2. Fund efforts to increase points of access to comprehensive health, dental and mental care where farm workers and their families live and work. Consider alternative models and methods such as mobile units that bring health care directly to farm workers in their communities.
3. An information center for migrant farm workers would be a useful element in

Beaufort. Through the center, migrant farm workers would have access to information on local resources, health services and other programs. English classes for adults could be taught at the center.

4. Wal-Mart, which is the large supermarket in Beaufort, and the main place where migrants purchase their groceries, should be encouraged to conduct a cost-benefit analysis of providing transportation to and from the migrant camps. The shuttle should make two trips a day and run twice during the week (for example, Tuesday and Thursday) and once on the week end. This will be beneficial to both Wal-Mart and migrant farm workers.

The information provided from this project adds to the limited body of knowledge regarding the nutrition and health needs of migrant farm workers and their families. The knowledge base developed can inform the development of policy and procedures surrounding utilization of food assistance and other health and nutrition-related services, and contributes to outreach education programs by providing needed information for intervention planning for the health and well being of the migrant farm worker population.

APPENDICES

Appendix 1:**Tables**

Table 1.1 Timeline complete interventions

	June 2005			July 2005			
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Consent Letters	■						
Pre-Test	■						
Passive Intervention	■						
Cooking Classes		■	■	■	■	■	
Dental Intervention		■	■	■	■	■	
Hand-washing intervention			■			■	
Food Guide Pyramid		■					
Physical Activity		■					
Color Me Healthy		■					
Camp Visit			■		■		
Post-test						■	

Table 1.2 Parents Head Start Questionnaire (n=21)

	Questions	Yes	No
QP1	Bottle-feeding: previous 3 month, currently or within 3 month?	5%	81%
QP2	Will you be bringing breast milk to the center?	0%	86%
QP3	Learning to use cup: currently or within 3 month?	76%	10%
QP4	Learning to feed self: currently or within 3 month?	71%	14%
QP5	Does your child have problem coping with change?	81%	5%
QP6	Does your child wear diapers?	10%	76%
QP7	Difficult swallowing?	0%	86%
QP8	Chokes easily?	0%	86%
QP9	Does your baby have problems with colic? Do you use herbal remedies?	0%	86%
QP10	Does your child currently have any trouble with teeth or gums? If yes, please describe.	14%	71%
QP11	Do you have concerns with your child's appetite?	14%	71%
QP12	Are there any foods that you do not want your child to eat due to religious beliefs or cultural beliefs?	0%	86%
QP13	Medication?	0%	86%
QP14	Positive TB Test?	0%	86%

Table 1.2 Parents Head Start Questionnaire (n=21) (Continued)

	Questions	Yes	No
QP15	History of frequent colds or coughs?	5%	81%
QP16	History of chicken pox?	0%	86%
QP17	History of meningitis?	0%	86%
QP18	History of frequent headaches?	0%	86%
QP19	History of rheumatic fever?	0%	86%
QP20	History of joint pain or swelling?	0%	86%
QP21	History of anemia?	0%	86%
QP22	History of intestinal parasites?	0%	86%
QP23	History of frequent diarrhea? Constipation? Chronic stomach pain?	5%	81%
QP24	History of bladder infections?	5%	81%
QP25	History of chronic high fever?	0%	
QP26	Skin conditions: Dermatitis? Eczema? Frequent diaper rash? Burns? Others? If yes, what was the treatment for condition?	5%	81%
QP27	Does your child have any significant birthmarks/moles/skin marks?	33%	52%

Table 1.2 Parents Head Start Questionnaire (n=21) (Continued)

	Questions	Yes	No
QP28	History of eye infection in the last year?	0%	86%
QP29	Heart problems?/ What kind?/Any special treatment?	0%	86%
QP30	Does anyone in your household work with pesticides?	48%	38%
QP31	Have your child been tested for lead? Date tested?	10%	90%
QP32	Prenatal exposure to: Nicotine? Alcohol? Medications?	0%	86%
QP33	Was your child born two weeks early of late from their due date? If so, how many weeks early or late?	0%	86%
QP34	Complications with birth? Did your child go home from hospital with you?	14%	71%
QP35	Special needs? Identified disability?	0%	86%
QP36	History of seizures?	0%	86%
QP37	Trouble breathing? Asthma?	76%	10%
QP38	Trouble hearing? Ear infections? How many last year?	5%	81%
QP39	Trouble seeing? Glasses?	5%	81%
QP40	Does your child have special needs with transportation?	0%	86%
QP41	Allergies: medications, insects, etc?	0%	81%
QP42	Allergies: food?	0%	76%

Table 1.3 Analysis of Menus Results

	Recommended	Mean	Std. Error	Std. Deviation
Calories kcal	1600	1635.035	50.79372	221.4047
Protein (g)	50	67.2016	2.06842	9.01603
Carbohydrates (g)	130	225.4247	9.12043	39.75504
Fat (g)	53	53.6674	3.32921	14.51167
Saturated Fat (g)	17	17.8474	1.18043	5.14536
Mono Fat (g)	19	17.8974	0.99713	4.34637
Poly Fat (g)	17	8.4153	0.85197	3.71364
Trans Fatty Acid	0	0	0	0
Cholesterol (mg/dL)	<170	200.1316	23.79125	103.70367
Vitamin A (IU)	2000	4803.936	676.6713	2949.54184
Vit B1 Thiamin (mg)	0.6	1.0337	0.05774	0.25167
Vit B2 Riboflavin (mg)	0.6	0.9689	0.04063	0.1771
Vit B3 Niacin (mg)	8	10.6753	0.89076	3.88273
Vit B6 (mg)	0.6	0.8126	0.07641	0.33305
Vit B12 (mcg)	1.2	1.5768	0.20175	0.87941
Biotin (mcg)	12	1.9079	0.14775	0.64402
Vitamin C (mg)	40-45	105.2468	7.55314	32.92337
Vitamin D (IU)	200	244.0832	5.27375	22.98773
Folate (mcg)	200	235.6463	18.80657	81.97594
Pantothenic Acid (mg)	3	1.6805	0.08278	0.36082
Calcium (mg)	500-800	1097.954	33.28104	145.0687
Iron (mg)	7-10	9.5253	0.42553	1.85484
Magnesium (mg)	130	108.4484	4.13627	18.02959
Phosphorus (mg)	500	539.2811	24.16361	105.32675
Potassium (mg)	3800	1234.223	54.45071	237.34514
Sodium (mg)	2000	2901.425	130.2636	567.80592
Zinc (mg)	3-5	4.1447	0.24893	1.08504

Table 1.4 Children Demographic

Demographic Characteristic	Number	Percent
Gender		
Female	11	52.40%
Male	10	47.60%
Total	21	100%
Age		
3	11	52.20%
4	5	23.80%
5	4	19%
Total	21	100%
Race/Ethnic Status		
Mexican	9	42.90%
Mexican/American	12	57.10%
Total	21	100%
Language		
Only Spanish	10	47.62%
Spanish and English as a second language	11	52.38%
Total	21	100%
Insurance		
Medical and Dental Insurance	3	14.30%
No Medical Insurance	18	85.70%
Total	21	100%

Table 1.5 Knowledge Questions Results

	Questions	Correct Answer	% Correct answer Pre-test	%Correct answer Post-test
K1	What is the healthiest snack choice?	Fruit juice and peanuts	0.0%	100.0%
K2	Which food is a low-fat snack?	Pretzels	0.0%	85.7%
K3	Which one is a healthy lunch?	Spaghetti with meatballs sauce and chocolate milk	10.0%	81.0%
K4	How many servings of vegetables do you need each day?	3 to 5 servings	0.0%	81.0%
K5	What important nutrient does the milk group have?	Calcium	0.0%	0.0%
K6	How much fruit do you think we should eat each day?	5 servings	0.0%	66.7%
K7	How many vegetables do you think we should eat each day?	4 servings	5.0%	95.2%
K8	When Do I have to Wash My Hands?	After we play with the dog	57.0%	100.0%
K9	When Do I have to Wash My Hands?	After to used the restroom	81.0%	100.0%
K10	When Do I have to Wash My Hands?	Before eat your meals	57.0%	100.0%
K11	If I think a food may be "spoiled", I ...	Throw it in the trash	33.0%	100.0%
K12	Which food would always be safe to pack in a snack lunch?	Peanut butter	19.0%	95.2%
K13	How long should I wash my hands before I touch or eat food?	As long as it takes to sing Happy Birthday	10.0%	95.2%
K14	Circle the best thing to do RIGHT before cooking or eating food	Wash your hands	57.0%	95.2%
K15	We should wash fruits and vegetables before we eat them	To wash off the germs and dirt	10.0%	95.2%
K16	What makes foods unsafe to eat when left out for more than 2 hours?	Germs can grow on the food	5.0%	95.2%
K17	Which drink is the best choice ?	Glass of juice	14.3%	80.9%
K18	Which fast food lunch is the best choice?	Cheese burger, medium fries, milk	14.3%	85.7%

Table 1.6 Behavioral Results

Question	Pre Test		
	Almost always	Sometimes	Not very often
B1 I wash my hands before I touch or eat foods	9.50%	71.40%	19.00%
B2 I eat different kind of fruit every day	-	47.60%	52.40%
B3 I eat different kinds of vegetables every day	-	28.60%	71.40%
B4 I drink milk or eat cheese at least once a day	-	90.50%	9.50%
B5 I am physically active every day (I do things like run, play sports, walk to or from school, dance, ride a bike, exercises, or rollerblade)	14.30%	71.40%	14.30%
B6 I eat vegetables at lunch and dinner	-	28.60%	71.40%
B7 I eat breakfast every day	76.20%	23.80%	-
B8 I eat candy or chips every day	-	100.00%	-
B9 I wash my hands before meals	9.50%	90.50%	-
B10 I like to try new foods	23.80%	76.20%	-

Table 1.6 Behavioral Results (Continued)

		Post Test		
Question		Almost always	Sometimes	Not very often
B1	I wash my hands before I touch or eat foods	76.20%	23.80%	-
B2	I eat different kind of fruit every day	-	95.20%	4.80%
B3	I eat different kinds of vegetables every day	-	81.00%	19.00%
B4	I drink milk or eat cheese at least once a day	4.80%	90.50%	4.80%
B5	I am physically active every day (I do things like run, play sports, walk to or from school, dance, ride a bike, exercises, or rollerblade)	81.00%	19.00%	-
B6	I eat vegetables at lunch and dinner	-	100.00%	-
B7	I eat breakfast every day	81.00%	19.00%	-
B8	I eat candy or chips every day	19.00%	81.00%	-
B9	I wash my hands before meals	52.40%	47.60%	-
B10	I like to try new foods	52.40%	47.60%	-

Table 1.7 Food Guide Pyramid Results

		Post-Test
	Correct Answer	% Children Answered Correctly
P1	Do you know the food pyramid?	100% answered YES
P2	Circle the foods from the Grain Group	Tortillas, Bread, Cereal 57.14%
P3	Circle the foods from the Vegetable Group	Bell peppers, lettuce, pepping 85.71%
P4	Circle the foods the Milk Group	Ice cream, Cheese, Yogurt 90.48%
P5	How many different food groups from the Food Guide Pyramid are found in a cheeseburger? Circle the correct number	4 or 5 100.00%
P6	The Food Guide Pyramid tell us	how much to eat of different kinds of food 100.00%
P7	From which food group should eat the most servings in a day?	grain group 52.38%
P8	What food group do eggs belong to?	meat group 85.71%
P9	¿What food groups are part of the Food Guide Pyramid?	grain, vegetable, fruit, milk, meat, fats and sweets groups 66.67%
P10	The foods we should eat most often are at the bottom of the Pyramid. Circle the food group that belongs at the bottom of the Pyramid	bread, cereal, rice and pasta group 95.24%
P11	The food we should eat least often are at the top of the Pyramid. Circle the food group that belongs at the top of the Pyramid.	fats, oils and sweets group 95.24%
P12	How many servings from the milk, yogurt and cheese group should we eat each day?	2 or 3 servings 95.24%

Appendix 2:
Key Informant Consent Form

Consent Form for Participation in a Research Study Clemson University

The Health and Nutrition of Migrant Farm Workers and Their Families

Description of the research and your participation

You are invited to participate in a research study conducted by Katherine L. Cason and Abel Caballero, a student under the direction of Dr. Cason. The purpose of this research is to gather information about the health and nutrition needs of migrant farm workers

Your participation will involve an interview that will address questions regarding the demographic makeup of migrant farm worker population in the community; 2) community structure; 3) services provided to migrants; 4) migrant farm worker health issues, and how well they are met; and 5) service gaps and barriers to service utilization.

Your participation is voluntary and you may withdraw from the study at any time without penalty. You are encouraged to ask questions you may have during the course of the study. The amount of time required for your participation is approximately 1 hour.

Risks and discomforts

There are no known risks associated with this research. You may be uncomfortable answering some of the survey questions and you are free to not answer any questions that you choose.

Potential benefits

There are no known benefits to you that would result from your participation in this research. However, this research may help us to understand more about the health and nutrition needs of the migrant farm worker population so that we can improve our educational programs in the future.

Cost

There is no direct cost to you.

Protection of confidentiality

The records of your participation are anonymous and confidential. The investigator will maintain your information, and this information may be kept on a computer. Study information or data may be examined by the Institutional Review Board of Clemson University. This study may result in scientific presentations and publications. Your identity will not be revealed in any publication that might result from this study.

In rare cases, a research study will be evaluated by an oversight agency, such as the Clemson University Institutional Review Board or the federal Office for Human

Research Protections, that would require that we share the information we collect from you. If this happens, the information would only be used to determine if we conducted this study properly and adequately protected your rights as a participant.

Voluntary participation

Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

Contact information

If you have any questions or concerns about this study or if any problems arise, please contact Katherine L. Cason at 864-656-0539. If you have any questions or concerns about your rights as a research participant, please contact the Clemson University Institutional Review Board at 864.656.6460.

Consent

**I have read this consent form and have been given the opportunity to ask questions.
I give my consent to participate in this study.**

Participant's signature: _____ Date: _____

A copy of this consent form should be given to you.

Appendix 3:
Parents Consent Form

Forma de Consentimiento para la Participación de su Hijo en el Proyecto de Investigación (Color Me Healthy) – Migrant Head Start Program

INFORMACION:

Su hijo ha sido invitado a participar en un proyecto de investigación. Para proteger los derechos de los participantes en este estudio el “Institutional Review Board” (IRB) de Clemson University revisó el procedimiento que seguiremos. La revisión del IRB se llevo a cabo siguiendo las leyes estatales y federales.

Sin embargo antes de permitir que su hijo participe en este proyecto de investigación es necesario que lea la siguiente información y pregunte todas las dudas que pudiera tener ya que para nosotros es necesario el saber que usted entendió todo lo que involucra la participación de su hijo en este proyecto.

Al firmar esta forma de consentimiento usted reconoce que recibió del investigador principal y/o sus representantes toda la información que se presenta a continuación. Además que se le dijo la oportunidad de discutir sus preguntas y preocupaciones con el investigador principal o con el co-investigador. Su hijo también tendrá la oportunidad de dar su consentimiento para participar en este proyecto de investigación. Además si usted tiene alguna pregunta relacionada con los derechos de su hijo al ser participante en este estudio por favor no dude en contactar a algún miembro del IRB al 864-656-0636.

OBJETIVO:

El objetivo de este estudio es observar los conocimientos y comportamientos adquiridos durante el programa de nutrición educativo titulado “Color Me Healthy”. Los conocimientos adquiridos durante el programa serán utilizados para ayudar a los niños en Carolina del Sur a mejorar sus selecciones alimenticias y sus hábitos de actividad físico. El programa/proyecto contará con la participación de aproximadamente 45 niños.

PROCEDIMIENTO:

- ◆ Su hijo participara en un programa educativo relacionado con la actividad fisica y nutrición titulado “Color Me Healthy”.
- ◆ El programa se llevara a cabo durante el día y tendrá una duración aproximada de una hora.
- ◆ Los estudiantes van a recibir lecciones acerca de la importancia de la actividad física, los alimentos, la higiene de los alimentos, se incluirán temas como la pirámide nutricional, los grupos de alimentos, botanas saludables y lavado de manos.
- ◆ Las lecciones incluirán discusiones cortas, preparación de alimentos y algunos juegos que incluirán actividades físicas.
- ◆ Algunas de las lecciones incluirán la preparación y el consumo de botanas saludables. El instructor que conducirá las lecciones será capacitado en las prácticas de cocina y en el manejo higiénico de los alimentos. El instructor seguirá procedimientos estándar para minimizar el riesgo de lesiones o enfermedades.
- ◆ Vamos a hacer algunas preguntas a sus hijos antes de comenzar el programa y también al finalizar el programa. Esto se hará para saber si el programa tuvo impacto en los conocimientos de nutrición y en la preparación de alimentos.
- ◆ El cuestionario tomara aproximadamente 10 minutos e incluye algunas preguntas sencillas relacionadas con nutrición y los alimentos.

POSIBLES RIESGOS:

Los riesgos por participar en este estudio son mínimos. Antes de comenzar el programa educativo los educadores chequearan la presencia de alergias. Ningún objeto filoso se utilizará durante la preparación de los alimentos y debido a que las actividades físicas son como juegos normales estas no son extenuantes. Si su hijo se llegara a lesionar mientras juega o se enferma al probar alguna de las botanitas, el niño será llevado a la enfermería inmediatamente.

REQUISITOS PARA LA EXCLUSION DE PARTICIPANTES:

El niño que tenga alguna condición pre-existente que obstruya su participación será excluido del programa. Por favor enliste cualquier condición pre-existente que su niño pudiera tener y que pudieran excluir a su hijo de la participación en este programa. (ej. Cualquier alergia, enfermedades y otras limitaciones)

Si no conoce ninguna enfermedad o alergia por favor escriba, "Ninguna".....

BENEFICIO POTENCIAL:

Los beneficios específicos que los niños obtendrán al participar en este estudio son el aumento de conocimientos en nutrición. También esperamos el poder aprender el como los niños aprenden nutrición y a preparar alimentos y así nosotros poder mejorar nuestros programas en el futuro.

PARTICIPACION VOLUNTARIA:

La participación en este estudio es voluntaria. Usted puede decidir que su hijo no participe en este proyecto o también retirar a su hijo en cualquier momento. Si usted decide que su hijo no participe en este proyecto o decide retirar a su hijo en cualquier momento no va a recibir ninguna penalización por esto. Su decisión no afectara la relación suya o de su hijo con este programa. Usted será informado de cualquier cambio o información nueva que pudiera afectar su decisión de permitir la participación de su hijo en el anonimato.

PREGUNTAS:

Para obtener mas información relacionadas con este estudio y para obtener información acerca de posibles riesgos relacionados con este estudio, usted puede contactar al investigador principal, **Katherine L. Cason al 864-656-0539**. También pudiera contactar a algún miembro del Institutional Review Board de la Universidad de Clemson (864-656-0636) para obtener información acerca de los derechos de los participantes de este estudio.

PERMISO:

Se me dio la oportunidad de hacer preguntas relacionadas con este estudio, si hubo alguna pregunta esta fue contestada satisfactoriamente. Considerando todo lo anterior le otorgo el permiso para que participe en este proyecto de investigación. Recibí una copia de esta forma de consentimiento.

FIRMA DEL PADRE: _____ FECHA: _____
 NOMBRE DEL HIJO: _____

Información del Investigador:

Dr. Katherine Cason, Profesor
 Clemson University, Departamento de
 Ciencia de los Alimentos y Nutrición Humana
 Teléfono: 864-656-0539

Fecha: ____ de Junio del 2005

Página 2 de 2

Appendix 4:
Cooking recipes

Ham and Cheese Quesadilla



- 1 Flour Tortillas
- 1 slice American cheese
- 1 slice Ham

TOP tortilla with a slice of cheese and a slice of ham; fold in half.
 COOK in skillet sprayed with cooking spray on medium heat until lightly browned on both sides.
 Cut into triangles to serve.

Vegetarian Quesadillas



- 1. can black beans, drained and rinsed
- 1 zucchini, diced or shredded
- 2 scallions, diced
- 1 cup chunky salsa
- 1 cup shredded monterey jack cheese
- 4-8 large flour tortillas

sour cream and/or guacamole on the side

In a medium bowl, mix together the beans, zucchini, scallions and salsa. Spoon about 1/3 to 1/4 of the mixture on a tortilla, then sprinkle a handful of cheese over it and top with another tortilla. Place in a large skillet over medium heat until it begins to brown, then flip it over to heat the other side. Cut into fourths and serve with sour cream and guacamole.

Fast Snack Sandwich



- 3 sliced Tomato,
- 2 slice Cheese,
- 2 slice Ham
- 1 T peanut butter or
- 1 T mayonnaise
- 4 slices of wheat bread

Crunchy Bananas

2 bananas

5 tablespoon Peanut butter or
1 cup of yogurt (what ever flavor)
1 cup of your favorite Corn Flakes

Peel bananas. Roll them in peanut butter or yogurt, and finally roll them over crushed cereal. Put in the freezer for 5 minutes and serve.

Fruit salad

2 cups cubed fresh pineapple or canned pineapple
1 pint fresh strawberries, hulled and sliced
2 kiwi fruit, peeled and sliced
3 medium bananas, sliced
2 oranges, peeled and sectioned
1 cup seedless grapes
1 pint blueberries

Vegetables salad

Lettuce Leaves
Spinach Leaves
1 large sweet bell peppers
2 medium onions
4 medium tomatoes
2 cans of tuna
2 hard boiled eggs, chopped
3 T. fresh lemon juice
Salt and pepper
Vegetable oil or olive oil

Appendix 5:
The Glitter-bug kit

The GlitterBug® Training Device

GlitterBug is a product line that makes hand hygiene education interesting, fun, and memorable. The GlitterBug Potion is a fluorescent lotion that is used with a UVA lamp making it possible to see how well hands are washed, while the GlitterBug Powder is used to see how contamination and germs can travel. Perfect for schools, healthcare providers and food-handling businesses, GlitterBug products provide a valuable tool for teaching proper hand-hygiene techniques. Students have fun while learning about germs and proper handwashing and therefore remember the message. GlitterBug, by Brevis Corporation, makes learning proper hand hygiene (the most important means to prevent the spread of infections) an entertaining and illuminating experience. Order GlitterBug today to keep transient pathogens at bay.

GlitterBug® Potion Pump Bottle

Teach good handwashing technique Magically! Potion is formulated from a UV fluorescent powder mixed in a special hand lotion. The pump dispenses just the right amount to cover a pair of hands, decreasing waste. Over 200 applications per 240ml bottle. Now available in the new 50ml tottle bottle which has convenient eyelet for hanging.

GlowBar bulb

This is the original classic GlowBar. Versatility is the name of the game here. It runs a good long time on 4 D batteries or it may be plugged in with the optional adapter. Use GlowBar as a portable unit to scan hands and surfaces. The 279mm UVA bulb (11 inch) illuminates a full pair of hands from one position. This is the same lamp that fits the GlitterBug Disclosure Center shown on page 7. GlowBar runs on 4 D-cell batteries (included) or plug it in with the optional AC/DC 6-volt adapter. Unit measures 324mm W X 79mm H X 41mm D.

From: www.glitterbug.com

Appendix 6:
English Questionnaire

Knowledge Questions

K1. What is the healthiest snack choice?

a. Soda pop and chips



b. Milkshake and fries



c. Fruti juice and peanuts



K2. Which food is a low-fat snack?

a. pretzels

b. potato chips

c. doughnuts

K3. Which one is a healthy lunch?

a. cheese burger and French fries

b. pepperoni pizza y soda

c. spaghetti with meatball sauce and chocolate milk

K4. How many servings of vegetables do you need each day?

a. 2-3

b. 1-2

c. 3-5

d. 4-5

K5. What important nutrient does the milk group have?

a. fiber

b. vitamin C

c. calcium

d. iron

K6. How much fruit do you think we should eat each day?



How much fruit do you think we should eat each day?

Hmmm, I think we should eat...
a. 3 servings
b. 1 serving
c. 5 servings



K7. How many vegetables do you think we should eat each day?

I think we should eat...
a. 2 servings
b. 4 servings
c. 8 servings



How many vegetables do you think we should eat each

K8. When Do I have to Wash My Hands?

Before



After

K9. When Do I have to Wash My Hands?

Before



After

K10. When Do I have to Wash My Hands?

Before



After

K11. If I think a food may be "spoiled", I ...

a. cook it



b. taste it to see if it taste OK



c. throw it in the trash



K12. Which food would always be safe to pack in a snack lunch?

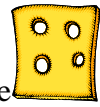
a. Sliced ham



b. Peanut butter



c. Sliced cheese

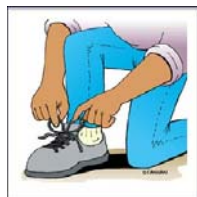


K13. How long should I wash my hands before I touch or eat food?

- As long as it takes to say my name
- As long as it takes to sing "Happy Birthday"
- As long as it takes to eat an apple



K14. Circle the best thing to do RIGHT before cooking or eating food



K15. We should wash fruits and vegetables before we eat them

- to keep the fresh
- only if they are dirty
- to wash off the germs and dirt
- to make them juicy

K16. What makes foods unsafe to eat when left out for more than 2 hours?

- color of the food changes
- taste bad
- germs can grow on the food
- it gets cold

K17. Which drink is the best choice?



Lets have a healthy drink!!!



Ok! Let's have
a...
a. Can of soda
b. Glass of juice
c. Fruit drink in a box

K18. Which fast food lunch is the best choice?

Let's
have a
health
y fast
lunch!



Ok! Let's Have...

- a. Fried chicken sandwich, onion rings, ice cream cone, water.
- b. Double burger, large fries, medium soft drink
- c. Cheeseburger, médium fries, milk

Behavior Questions

B1. I wash my hands before I touch or eat foods

Almost always Sometimes Not very often



B2. I eat different kind of fruit every day

Almost always Sometimes Not very often



B3. I eat different kinds of vegetables every day

Almost always Sometimes Not very often



B4. I drink milk or eat cheese at least once a day

Almost always Sometimes Not very often



B5. I am physically active every day (I do things like run, play sports, walk to or from school, dance, ride a bike, exercises, or rollerblade)

Almost always Sometimes Not very often



B6. I eat vegetables at lunch and dinner

Almost always Sometimes Not very often

B7. I eat breakfast every day

Almost always Sometimes Not very often

B8. I eat candy or chips every day

Almost always Sometimes Not very often

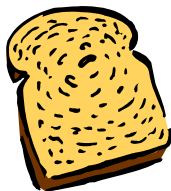
B9. I wash my hands before meals

Almost always Sometimes Not very often

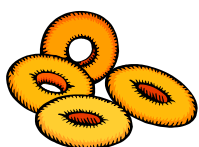
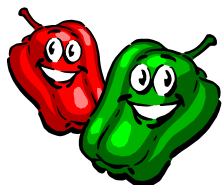
- B10. I like to try new foods
 Almost always Sometimes Not very often
- B11 Pretend you are going to prepare a sandwich. What do you usually do first?
 1 getting some meat from the refrigerator
 2 washing my hands
 3 laying out the sliced of bread
- B12 When you wash your hands what do you do?
 1 run some water over them quick and dry
 2 wash my hands with soap for a few seconds
 3 wash my hands with warm water and soap for 20 seconds
- B13 How often do you have fruit or juice for breakfast?
 0 Don't know
 1 almost every day
 2 sometimes (3 or 4 times a week)
 3 I don't have fruit or juice for breakfast

Food Guide Pyramid Questions

- P1. Do you know the food pyramid?
 yes no
- P2. Circle the foods from the Grain Group



P3. Circle the foods from the Vegetable Group

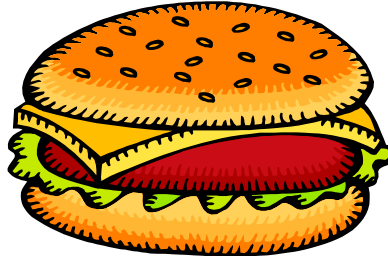


P4. Circle the foods the Milk Group



P5. How many different food groups from the Food Guide Pirámide are found in a cheeseburger? Circle the correct number

1 2 3 4 5



P6. The Food Guide Pyramid tell us

- a. the cost of different foods
- b. how much to eat of different kinas of food
- c. how to prepare foods we eat
- d. I have never seen the food guide pyramid

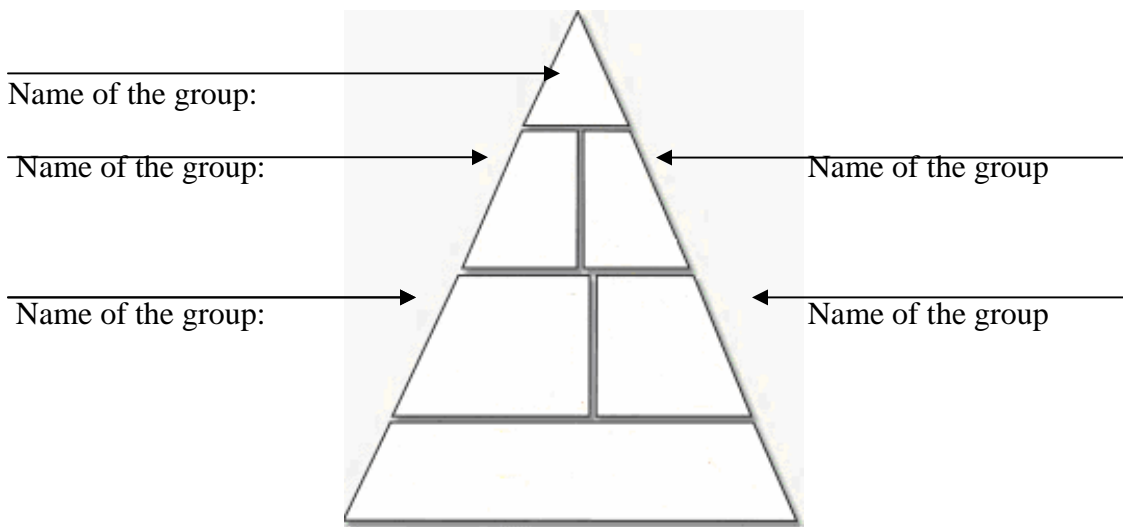
P7. From which food group should eat the most servings in a day?

- a. grain group
- b. vegetable group
- c. fruit group
- d. milk group
- e. meat group
- f. fats and sweets group

P8. What food group do eggs belong to?

- a. grain group
- b. vegetable group
- c. fruit group
- d. milk group
- e. meta group
- f. fats and sweets group

P9. What food groups are parts of the Food Guide Pyramid?



P10. The foods we should eat most often are at the bottom of the Pyramid. Circle the food group that belongs at the bottom of the Pyramid

- Bread, Cereal, Rice and Pasta Group
- Meat, Poultry, Fish, Dry Beans, Eggs and nuts Group
- Vegetable Group
- Milk, Yogurt and Cheese Group

P11. The foods we should eat least often are at the top of the Pyramid. Circle the food group that belongs at the top of the Pyramid.

- Bread, Cereal, Rice and Pasta Group
- Meat, Poultry, Fish, Dry Beans, Eggs and nuts Group
- grupo de los vegetales
- Fats, Oil and Sweets Group

P12. How many servings from the milk, yogurt and cheese group should we eat each day?

Hmm, let me think...

- 1 serving
- 2 ó 3 servings
- 5 servings



How many servings from the milk, yogurt and cheese group should we eat each day?

Appendix 7:
Spanish Questionnaire

Cuestionario de Conocimientos

K1. ¿Cuál es la merienda más saludable para comer durante el día?

a. soda y chips



b. batido y papas fritas



c. jugo de fruta y maní



K2. ¿Cuál de los snack a continuación es un alimento bajo en grasa?

a. pretzels

b. chips de papa

c. doughnuts

K3. ¿Cuál es un almuerzo saludable?

a. hamburguesa con queso y papas fritas

b. pizza de pepperoni y gaseosa

c. fideos con salsa de bolas de carne y leche chocolateada

K4. ¿Cuántas porciones de vegetales necesitas cada día?

a. 2-3

b. 1-2

c. 3-5

d. 4-5

K5. ¿Qué nutriente importante proporciona el grupo de la leche?

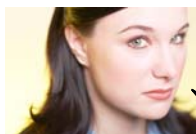
a. fibra

b. vitamina C

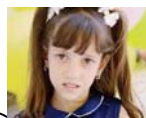
c. calcio

d. hierro

K6. ¿Cuánta fruta debemos consumir?



¿Cuánta fruta piensas tu que debemos consumir al día?



Hmmm, Yo pienso que debemos consumir...
a. 3 porciones
b. 1 porción
c. 5 porciones

K7. ¿Cuántos vegetales deberíamos consumir?

Yo pienso que deberíamos consumir...
 a. 2 porciones
 b. 4 porciones
 c. 8 porciones



¿Cuántos vegetales tu piensas que debemos consumir cada día?

K8. ¿Cuado debo lavarme las manos?

Antes



Después

K9. ¿Cuado debo lavarme las manos?

Antes



Después

K10. ¿Cuado debo lavarme las manos?

Antes



Después

K11. Si pienso que un alimento esta medio malogrado, Yo...

a. lo cocino



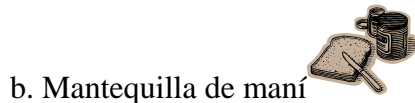
b. lo pruebo para saber si esta bien



c. Lo tiro a la basura

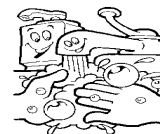


K12. ¿Qué alimento no se malogra cuando lo envuelves en una bolsa para llevar y comer luego?

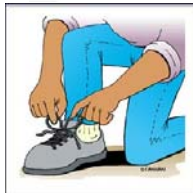


K13. ¿Cuánto tiempo debo lavarme las manos antes de tocar alimentos o antes de comer?

- El tiempo que me toma en decir mi nombre
- El tiempo que me toma en cantar “Cumpleaños”
- EL tiempo que me toma en comer una manzana



K14. Has un circulo sobre lo MEJOR que uno debe hacer antes de cocinar alimentos o consumir los alimentos



k15. Nosotros debemos lavar las frutas y vegetales antes de comerlos:

- para mantenerlos frescos
- solo si están sucios
- para lavarlos y eliminar los gérmenes y suciedad
- para hacerlos más jugosos

K16. ¿Qué es lo que hace a los alimentos no aptos para consumir cuando se les deja fuera por más de dos horas?

- el color del alimento cambia
- el sabor se torna malo
- los gérmenes crecen en el alimento
- se enfría

K17. ¿Qué refresco es la mejor opción?



Vamos a tomarnos un refresco saludable!!!



Ok! Tomaremos...
a. una soda en lata
b. vaso de jugo
c. jugo de fruta en caja

K18. ¿Cuál es la mejor opción de comida rápida para la hora del almuerzo?

Vamos a almorzar una comida rápida saludable!



Ok! almorcemos...
a. sándwich de pollo frito con aros de cebolla y cono de helado y agua.
b. hamburguesa doble, papas fritas grandes y un jugo mediano
c. hamburguesa con queso, papas fritas medianas y leche

Cuestionario de Hábitos

B1. Me lavo las manos antes de tocar o comer los alimentos.

Casi siempre

Algunas Veces

Casi nunca



B2. Como frutas diferentes todos los días

Casi siempre

Algunas Veces

Casi nunca



B3. Como vegetales diferentes todos los días

Casi siempre

Algunas Veces

Casi nunca

B4. Tomo leche o como queso por lo menos una vez al día

Casi siempre

Algunas veces

Casi nunca



B5. Estoy físicamente activo todos los días (hago cosas como correr, algún deporte, caminar de la escuela a la casa, montar bicicleta o patineta)

Casi siempre

Algunas Veces

Casi nunca



B6. Consumo vegetales en el almuerzo y cena

Casi siempre

Algunas Veces

Casi nunca

B7. Desayuno todos los días

Casi siempre

Algunas Veces

Casi nunca

B8. Consumo caramelos y chips todos los días

Casi siempre

Algunas Veces

Casi nunca

B9. Me lavo las manos antes de las comidas

Casi siempre

Algunas Veces

Casi nunca

B10. Me gusta probar nuevos alimentos

Casi siempre

Algunas Veces

Casi nunca

B11. Imagínate que vas a hacer un sándwich ¿Qué es lo primero que usualmente harías?

Yo empezaría a:

- a. sacar algo de carne de la refrigeradora
- b. lavarme las manos
- c. sacar el pan fuera de la bolsa

B12. Cuando te lavas las manos ¿que es lo que haces?

- a. Pongo agua sobre mis manos y las seco rápidamente
- b. pongo agua y jabón por algunos segundos
- c. agua tibia y jabón por 20 segundos

B13. ¿Qué tan a menudo consumes fruta o jugo de fruta en el desayuno?

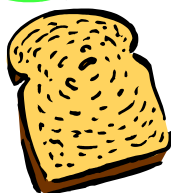
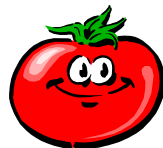
- a. Casi todos los días
- b. Algunas veces (3 ó 4 veces al día)
- c. Yo nunca consumo fruta o jugo de fruta en el desayuno

Cuestionario de la Pirámide de Alimentos

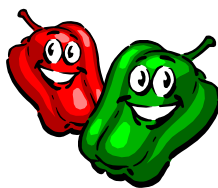
P1. ¿Conoce la Pirámide de Alimentos?

SI NO

P2. Grupo de los Cereales. Has un circulo en el alimento que pertenece al grupo de los Cereales



P3. El Grupo de los Vegetales Has un circulo en el alimento que pertenece al grupo de los Vegetales

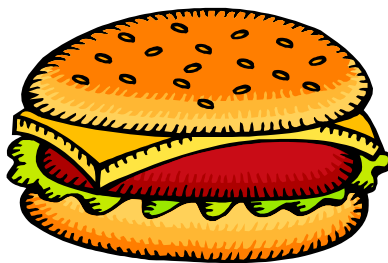


P4. Grupo de la Leche Has un circulo en el alimento que pertenece al grupo de los Leche



P5. Grupos de Alimentos Cuantos grupos de alimentos de la Pirámide de Alimentos se encuentran en una Hamburguesa con Queso

1 2 3 4 5



P6. La Pirámide de Alimentos nos dice (escoge una)

- El costo de los diferentes alimentos
- Cuanto comer de los diferentes tipos de alimentos
- Como preparar los alimentos que consumimos
- Nunca vi una Pirámide de Alimentos

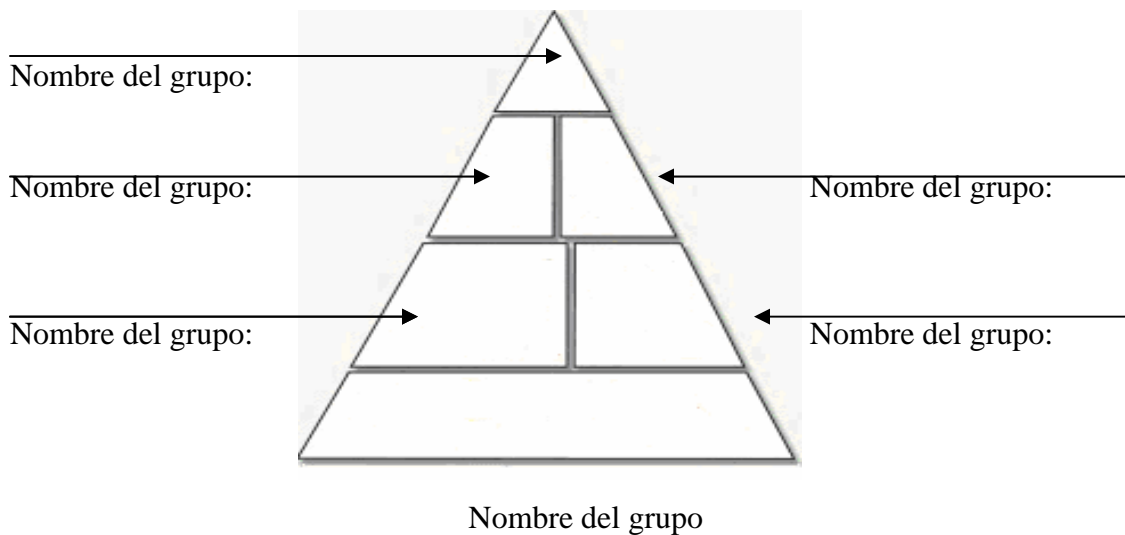
P7. ¿Cuáles son los alimentos que mas consumes al día dentro de los Grupos de Alimentos?

- grupo de los granos
- grupo de los vegetales
- grupo de las frutas
- grupo de la leche
- grupo de las carnes
- grupo de las grasas y azucares

P8. ¿A qué grupo de alimentos pertenecen los huevos?

- grupo de los granos
- grupo de los vegetales
- grupo de las frutas
- grupo de la leche
- grupo de las carnes
- grupo de las grasas y azucares

P9. ¿Qué grupo de alimentos son parte de la Pirámide de Alimentos? Escribe todas las que sepas.



P10. Los alimentos que debemos consumir en mayor cantidad están en la parte de debajo de la pirámide. Encierra en un círculo el grupo de alimentos que pertenece a la parte de debajo de la pirámide.

- grupo del Pan, Cereal, Arroz y Pasta
- grupo de la carne, pollo, pescado, granos secos, huevos y nueces
- grupo de los vegetales
- grupo de la leche, yogurt y el queso

P11. Los alimentos que debemos consumir en menor cantidad están en la parte de arriba de la pirámide. Encierra en un círculo el grupo de alimentos que pertenece a la parte de arriba de la pirámide.

- a. grupo del Pan, Cereal, Arroz y Pasta
- b. grupo de la carne, pollo, pescado, granos secos, huevos y nueces
- c. grupo de los vegetales
- d. grupo de las grasas, aceites y azúcares

P12. ¿Cuántas porciones del grupo de la leche?

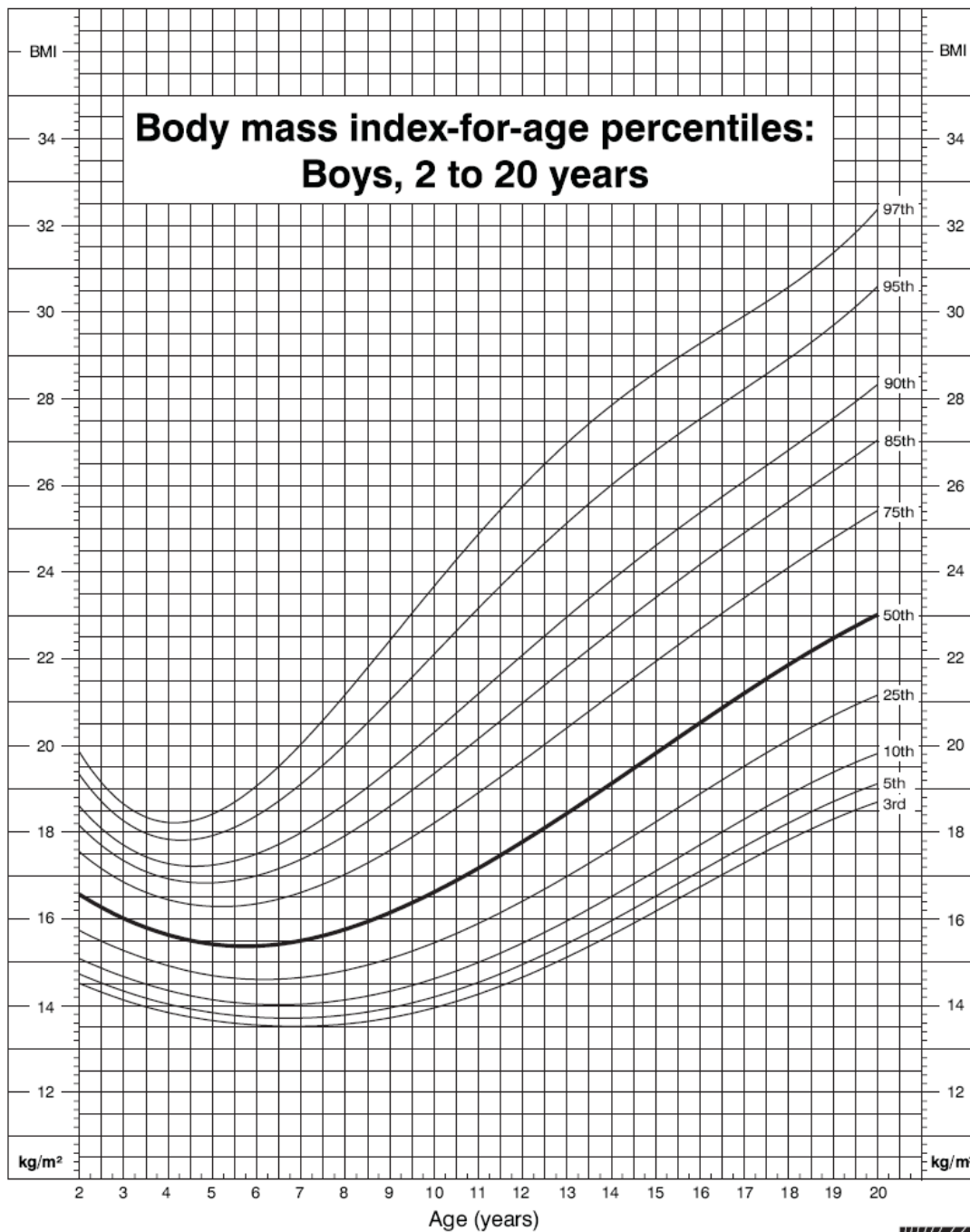
Hmm, déjame pensar...
a. 1 porción
b. 2 ó 3 porciones
c. 5 porciones



¿Cuántas porciones del grupo de la leche, yogurt y queso debemos consumir cada día?

Appendix 8:
BMI Growth Charts

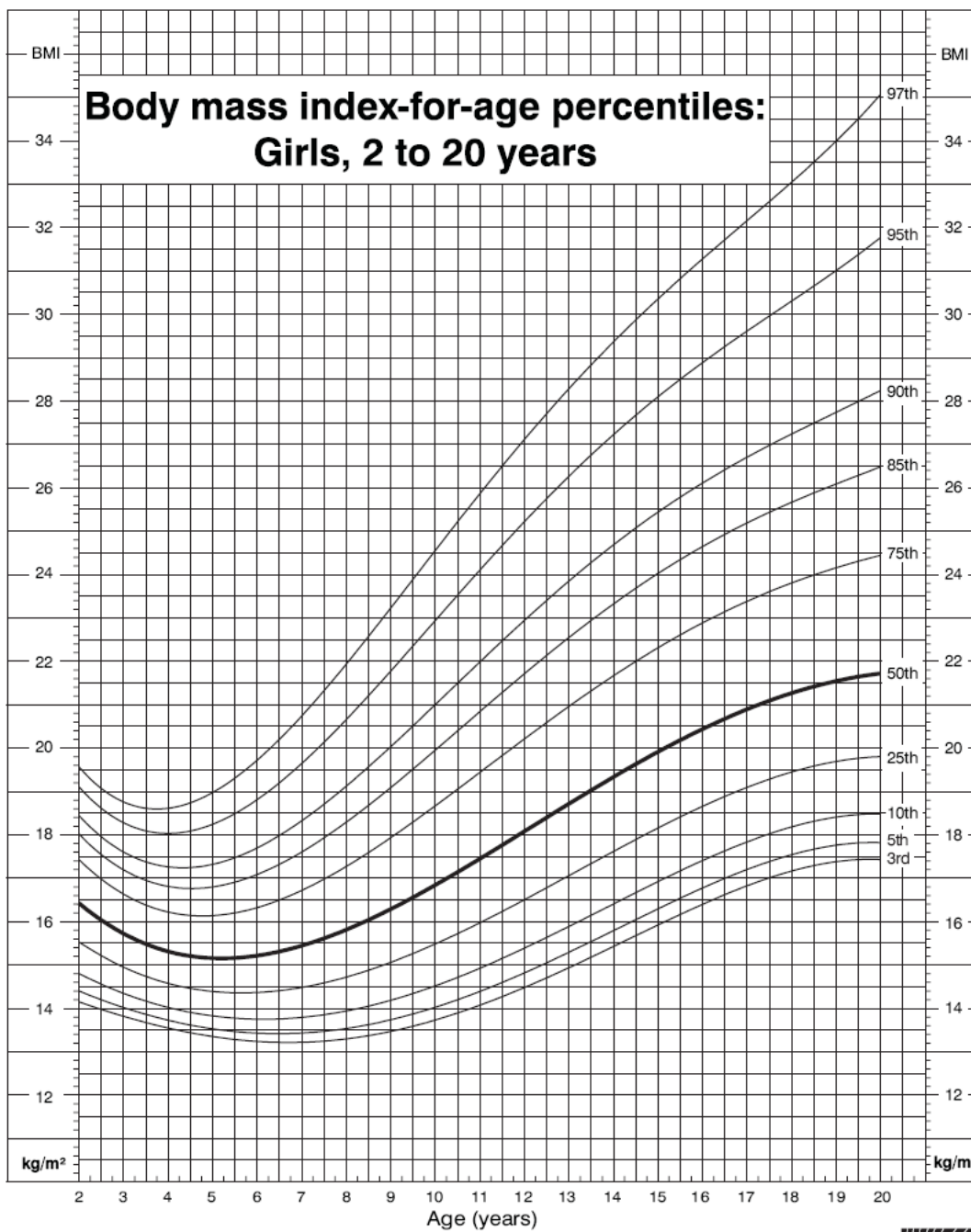
CDC Growth Charts: United States



Published May 30, 2000.
 SOURCE: Developed by the National Center for Health Statistics in collaboration with
 the National Center for Chronic Disease Prevention and Health Promotion (2000).



CDC Growth Charts: United States



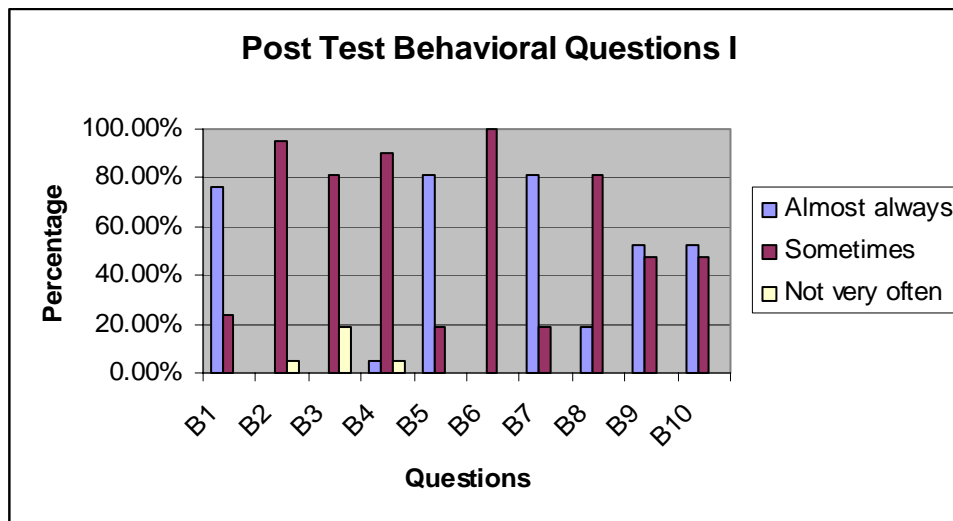
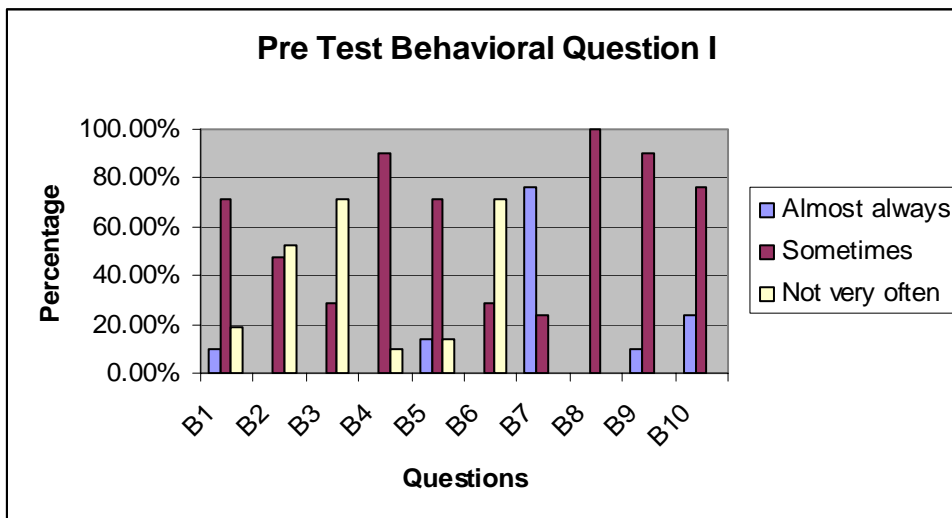
Published May 30, 2000.
 SOURCE: Developed by the National Center for Health Statistics in collaboration with
 the National Center for Chronic Disease Prevention and Health Promotion (2000).



Appendix 9:

Pre and Post Results Comparisons
Behavioral charts

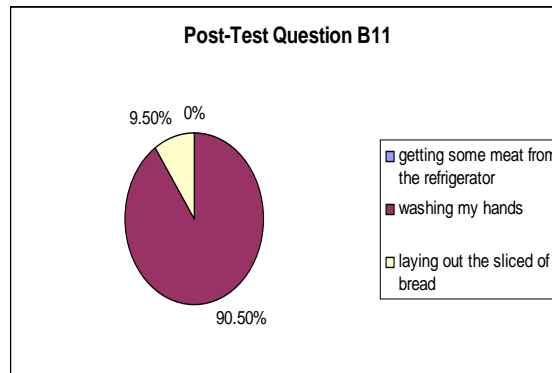
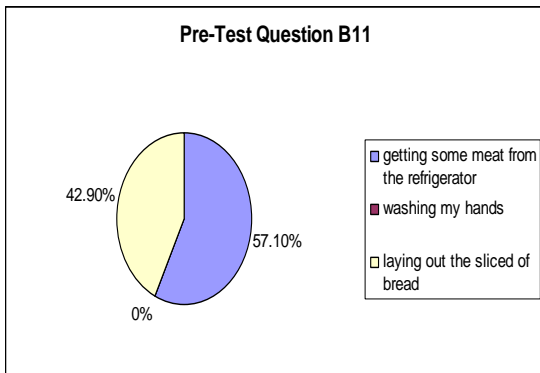
Pre and Post Test Behavior Charts Comparison



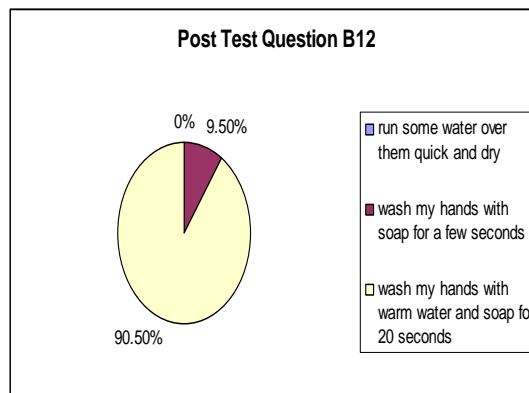
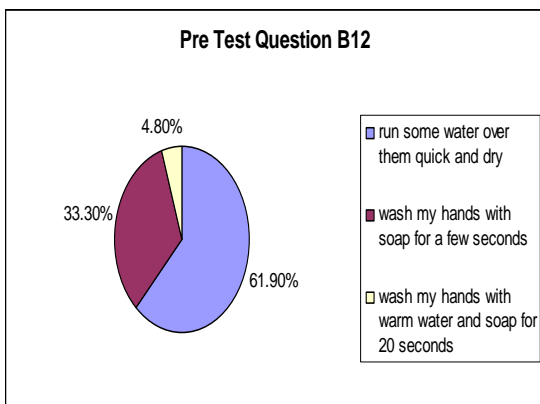
Questions

- B1 I wash my hands before I touch or eat foods
- B2 I eat different kind of fruit every day
- B3 I eat different kinds of vegetables every day
- B4 I drink milk or eat cheese at least once a day
- B5 I am physically active every day (I do things like run, play sports, walk to or from school, dance, ride a bike, exercises, or rollerblade)
- B6 I eat vegetables at lunch and dinner
- B7 I eat breakfast every day
- B8 I eat candy or chips every day
- B9 I wash my hands before meals
- B10 I like to try new foods

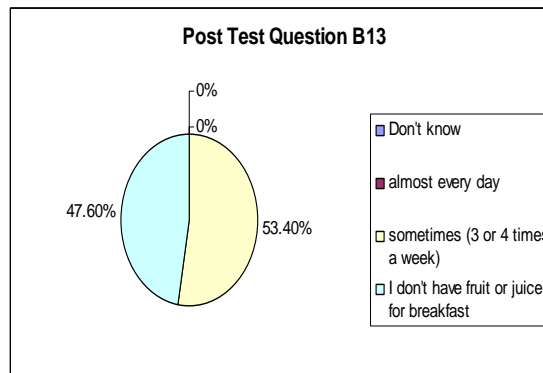
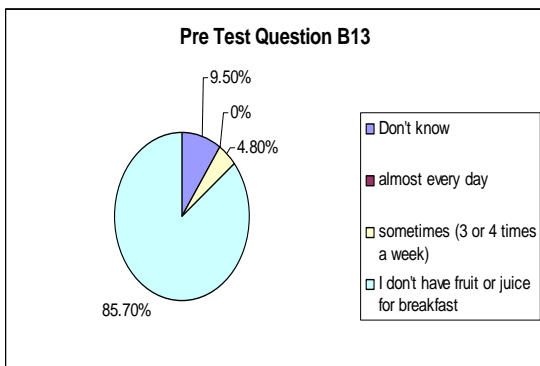
B11 Pretend you are going to prepare a sandwich. What do you usually do first?



B12 When you wash your hands what do you do?



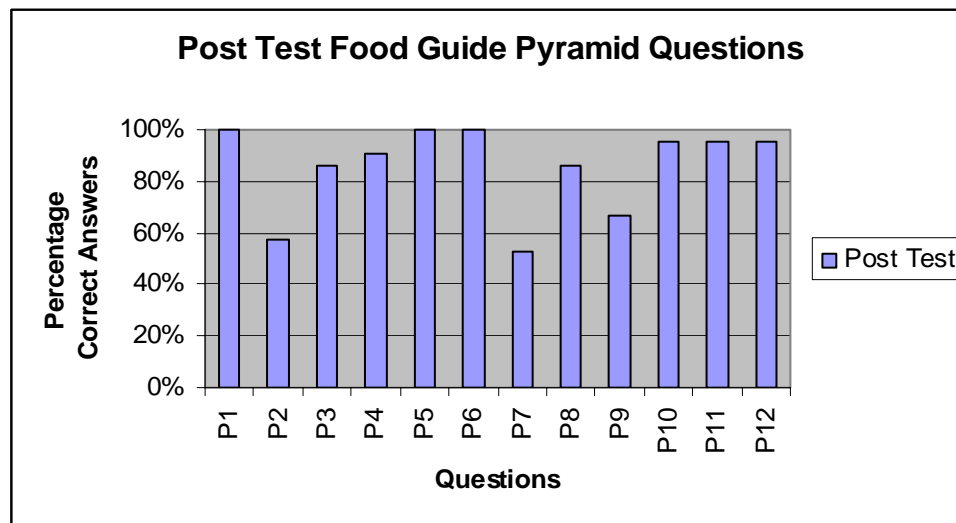
B13 How often do you have fruit or juice for breakfast?



Appendix 10:

Post Test Results Food Guide Pyramid chart

Post Test Food Guide Pyramid Chart Results



Questions

- P1 Do you know the food pyramid?
- P2 Circle the foods from the Grain Group
- P3 Circle the foods from the Vegetable Group
- P4 Circle the foods the Milk Group
- P5 How many different food groups from the Food Guide Pyramid are found in a cheeseburger?
Circle the correct number
- P6 The Food Guide Pyramid tell us
- P7 From which food group should eat the most servings in a day?
- P8 What food group do eggs belong to?
- P9 ¿What food groups are part of the Food Guide Pyramid?
- P10 The foods we should eat most often are at the bottom of the Pyramid. Circle the food group that belongs at the bottom of the Pyramid
- P11 The food we should eat least often are at the top of the Pyramid. Circle the food group that belongs at the top of the Pyramid.
- P12 How many servings from the milk, yogurt and cheese group should we eat each day

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