RESULTS FROM AN ASSESSMENT SURVEY FOR SCHOOL FOOD SERVICE DIRECTORS AND SCHOOL FOODSERVICE MANAGERS PARTICIPATING IN THE 2011-2012 SOUTH CAROLINA FARM TO SCHOOL PROGRAM

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RESULTS FROM AN ASSESMENT SURVEY FOR SCHOOL FOOD SERVICE DIRECTORS AND SCHOOL FOODSERVICE MANAGERS PARTICIPATING IN THE 2011-2012 SOUTH CAROLINA FARM TO SCHOOL PROGRAM

A Thesis
Presented to
The Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
Food, Nutrition, and Culinary Sciences

by
Maciel Ugalde
August 2012

Accepted by:
Dr. Katherine L. Cason, Committee Chair
Dr. Sarah Griffin
Dr. Julie Northcutt
ABSTRACT

In South Carolina (SC), children aged 10-17 are ranked 13th in the United States for overweight and obesity (33.7%) according to the National Survey of Children’s Health 2007. Fruit and vegetable intake in children and adolescents in the United States is below recommended levels (Lorson, Melgar-Quinonez, & Taylor, 2009). In SC, only 15% of the high school students consume fruits and vegetables five or more times per day. Fruit and vegetable consumption has been associated with reduced risk of chronic diseases (Epstein et al., 2001; Knai, Pomerleau, Lock, & McKee, 2006; Reichmann, 2009). Schools are identified as a key setting for public health strategies to lower or prevent the prevalence of overweight and obese youth (Story, Nanney, & Schwartz, 2009).

Farm to School is a nationwide program that connects schools (k-12) and local farms with the objectives of serving healthy meals in school cafeterias, improving student nutrition, providing education opportunities on agriculture, health and nutrition, and supporting local and regional farmers. In 2010, the Centers for Disease Control and Prevention funded a two-year statewide pilot program in South Carolina. In general, the main goal of the Farm to School program in the cafeteria is to source, prepare, serve and promote consumption of local foods. School food service directors and school food service managers play an important role in accomplishing the program goals.
A total of 27 surveys were sent to school food service directors and 49 surveys went to school service managers in South Carolina. The overall response rate was 70.4% (n=19) and a 61.2% (n=30) for school food service directors and school food service managers respectively. Food service staff expressed knowledge of the 2011-2012 South Carolina Farm to School Program activities and support for it as well. The main opportunities found were the capabilities and abilities of the food service staff, as well as kitchen facilities and equipment. In addition, the results indicated that the technical assistance provided by the regional coordinators was very useful for implementation of the program in the school cafeteria. According to survey responses, the most frequent motivators for directors were: access to fresher fruits and vegetables and usage of higher-quality food. For the managers, motivators to implement the program included students eating better at schools and the possibility of obesity and overweight rates being reduced. The most frequent barriers and concerns expressed by respondents were inadequate availability of fruits and vegetables due to seasonality and finding local farmers to purchase from.
DEDICATION

To my grandparents Lidia Rosa Pascual and Raimundo González, my super heroes.
ACKNOWLEDGMENTS

First, I will like to thank God, for giving me the courage and guiding me throughout this process.

Raimundo González, Lidia Rosa Pascual, Lydia Esther González, Karina Ugalde, César Ugalde, and Reinol González. I am so lucky to have amazing people so close to me. Thank you for your support and for always taking good care of me. I also extend a heartfelt thank you, to all my relatives in Costa Rica, California and Florida, so far away but so close at the same time.

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I. INTRODUCTION

The prevalence of childhood obesity in the United States has increased over the past three decades (Singh, Kogan, & van Dyck, 2010). During this time, the rate has more than tripled and the current prevalence remains high among children across most age, sex, racial/ethnic, and socioeconomic groups (Singh et al., 2010). The increasing rates of overweight children are a significant and alarming public health problem. The National Health and Nutrition Examination Survey reported the prevalence of obesity at 16.9% and an overweight at 31.7% in children ages 2 to 19 (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). In South Carolina (SC), children aged 10-17 are ranked 13th in the United States for overweight and obesity (33.7%) (The Child and Adolescent Health Measurement Initiative, 2007).

The longer a child is overweight, the more likely he or she is to continue this pattern into adulthood (Biro & Wien, 2010; Rooney, Mathiason, & Schaubberger, 2011). Being overweight or obese can have serious consequences that include, but are not limited to, the presence of one or more risk factors, such as hyperlipidemia, hypertension, hyperinsulinemia, and an increased incidence of type 2 diabetes (Mahan, Escott-Stump, & Raymond, 2012). Other consequences associated with overweight and obese children include discrimination, negative self-image, depression, and decreased socialization (Mahan et al., 2012).

Genetic predisposition is an important factor in obesity development; however, genetics alone cannot explain the prevalence of obesity and overweight in children (Mahan et al., 2012). Many environmental factors are associated with childhood obesity.
For example, the availability of high-energy foods and sugar drinks, advertising of less healthy foods, and lack of daily, quality physical activity are the most common causes in the school setting (Centers of Disease Control and Prevention [CDC], 2011b). In SC, 72% of middle and high schools offered sugar drinks and 62% offer the less healthy competitive foods (CDC, 2011a). In addition, 54% allow advertising of less healthy foods in the school setting (CDC, 2011a).

Fruits and vegetables are nutrient-dense foods that provide vitamins, minerals, and other substances that may have positive health effects with relatively few calories (United States Department of Agriculture & United States Department of Health and Human Services., 2010). However, fruit and vegetable intake among children and adolescents in the United States are below recommended levels (Lorson, Melgar-Quinonez, & Taylor, 2009). In SC, only 15% of high school students consume fruits and vegetables five or more times per day (CDC, 2009).

The 2010 Dietary Guidelines for Americans recommend increasing the consumption of fruits and vegetables and eating a variety of vegetables, especially dark-green, red, and orange vegetables as well as beans and peas. The nutrition education tool, My-Plate, was developed to simplify the recommendations of these guidelines (United States Department of Agriculture., n.d.). In general, this tool consists of a dinner plate that is divided in four sections for vegetables, fruits, grains, and protein. The tool also includes a smaller plate on the side for dairy (United States Department of Agriculture., n.d.). The fruit and vegetable portions make up half of the plate emphasizing to include them as half of the plate in every meal (United States Department of Agriculture., n.d.).
Increasing fruit and vegetable consumption reduces the risk of chronic diseases (Epstein et al., 2001; Knai, Pomerleau, Lock, & McKee, 2006; Reichmann, 2009). The consumption of at least 2½ cups of fruits and vegetables per day is associated with a reduced risk of cardiovascular disease and may be protective against certain types of cancer (United States Department of Agriculture & United States Department of Health and Human Services., 2010). Additionally, fruits and vegetables are major contributors of a number of nutrients that are underconsumed in the United States including folate, magnesium, potassium, dietary fiber, and vitamins A, C, and K (United States Department of Agriculture & United States Department of Health and Human Services., 2010).

Schools have been identified as a key setting for public health strategies to lower or prevent the prevalence of overweight and obesity among youth (Story, Nanney, & Schwartz, 2009). As children grow, they acquire knowledge and assimilate concepts important to their lifestyle and habits. The early years are ideal for providing nutrition information and positive attitudes about all foods. As such, the school, including administration, teachers, students, and food services personnel, together with families and the community, should be encouraged to work together to support nutrition integrity in the educational setting.

As part of the effort to have healthier school environments, the 2011-2012 SC Farm to School Program aims to improve knowledge of locally grown fruits and vegetables and increase their consumption among children. The school cafeteria and foodservice staff play an important role in positively changing children’s behaviors. Food services
workers have been referred to as dietary “gatekeepers” and, consequently, more research and outreach needs to be directed toward educating and providing tools to these gatekeepers (Joshi & Azuma, 2008) and the school cafeteria environment.
II. BACKGROUND

School Food Environment

Healthy eating behaviors and physical activity are critical for children’s health and well-being. Dietary habits and preferences may be formed in childhood and become habitual over time (McAleese & Rankin, 2007; Venter & Harris, 2009). Children spend a significant amount of time and consume on average 35% of their daily food intake at school (Briefel, Crepinsek, Cabili, Wilson, & Gleason, 2009). Additionally, many schools offer the United States Department of Agriculture (USDA) School Lunch and Breakfast Programs (Wordell, Daratha, Mandal, Bindler, & Butkus, 2012). Schools that participate in federal meal programs are required to follow nutrition standards for federal meals and competitive foods (Blum et al., 2011). The following section offers a description of relevant factors of the school food environment associated with the availability of fruits and vegetables.

National School Lunch and Breakfast Programs

The National School Lunch Program (NSLP) and the National School Breakfast Program (NSBP) are federally assisted meal programs that provide nutritionally balanced, low-cost or free lunches to children that attend public or non-profit private schools, or who participate in residential childcare institutions (USDA, 2012). The NSLP operates in more than 90% of all public schools and 80% of those schools offer school breakfast (O’Toole, Anderson, Miller, & Guthrie, 2007).
Recently, the standards of the NSLP/NSBP have changed to align with the 2010 Dietary Guidelines for Americans (USDA, 2012b). Mandatory compliance with these new standards will begin on July 1st, 2012. Because the SC Farm to School program was implemented during the 2010-2011 school year, a general description of the standards from 1995 and 2000 will be provided in sections related to the Farm to School program implementation.

To meet the NSLP/NSBP standards, school lunches must provide one-third and breakfasts one-fourth of the Recommended Dietary Allowances (RDAs) for protein, calcium, iron, vitamin A, and vitamin C, on average, over the course of a week (Institute of Medicine, 2008). Nationwide, 94.9% of district nutrition services employees plan breakfast and lunch menus for schools (O’Toole et al., 2007). The minimum level of nutrients and calories that lunches offer depends on the menu planning approach used and the ages and grades served. Specifically, meal planners can use five approaches according to the old standards: (1) nutrient standard menu planning, (2) assisted nutrient standard menu planning, (3) traditional food-based menu planning, (4) enhanced food-based menu planning, and (5) alternate menu planning (Food and Nutrition Service, USDA, 2000).

The first two menu planning approaches are based on a nutrient analysis. With these approaches, the amount of daily servings of fruits and vegetables can vary. The traditional and enhanced food-based menu approaches are based on meal patterns. These approaches require serving five food items that include two or more fruits and vegetable
servings of 1/2 cup each (USDA, 1995; 2000). Of note, 100% vegetable or fruit juice cannot be used to meet more than one-half of the fruit and vegetable requirements. Cooked dry beans may be substituted as either a vegetable or a meat alternate, but not as both in the same meal (Food and Nutrition Service, USDA, 1995; Food and Nutrition Service, USDA, 2000). Under the enhanced menu planning approach, children in kindergarten through grade six are offered vegetables and fruits in minimum daily servings plus an additional one-half cup in any combination over a five-day period (Food and Nutrition Service, USDA, 1995; 2000). Similarly, according to the 2006 School Health Policies and Programs Study (SHPPS), the state of SC recommends that schools make more fruits or vegetables and healthful beverages available to students whenever other food or beverages are offered or sold (O’Toole et al., 2007).

The meals served as part of NSLP/NSBP program must meet specific requirements to get federal reimbursement and state compensation, if available (Institute of Medicine, 2008). There are three main budgetary inputs for providing high quality, nutritious school meals that apply to both the NSLP and the NSBP school meal programs and these are: (1) federal per meal cash reimbursements, (2) cost paid by participating children, and (3) cost for USDA commodities (Institute of Medicine, 2008).

The reimbursement rate is adjusted annually based on an index linked to the Consumer Price Index (which reflects changes in prices compared with those from the previous school year) and is published in the Federal Register by July 1 of each year to aid schools in planning for the new school year (Institute of Medicine, 2008). The
reimbursement rates for the 2011-2012 school year are shown in (Table 1). The level of reimbursement depends on whether an individual student qualifies for a full-price, reduced-price, or free meal (Institute of Medicine, 2008).

USDA agricultural commodities are minimally processed foods (Institute of Medicine, 2008). The Commodity Distribution Program provides commodities to schools that participate in the NSLP (Institute of Medicine, 2008). Through this program, school districts are entitled to a specific dollar value of commodities per school based on the total number of school lunches served plus a reimbursement rate (Institute of Medicine, 2008). In addition, if the USDA has a surplus of particular commodities, states may order any amount of these bonus commodities (Institute of Medicine, 2008). Offerings include fruits, vegetables, and fruit juices, among others.

Much effort has been made to improve the available commodity offerings. These offerings now include a larger portion of fruits, vegetables, and whole grains, as well as products with reduced total fat, saturated fat, sugar, and sodium (Institute of Medicine, 2008).

**Competitive Foods**

The USDA defines competitive foods as any foods sold at school outside of and in competition with federal meal programs (Blum et al., 2011). These include foods and beverages sold in schools through vending machines, à la carte purchases in cafeteria lines, school stores, and snack bars (Briefel et al., 2009). Other sources include foods used in fundraising and other school activities, or provided by teachers (Briefel et al.,
Competitive foods tend to be high in energy from fat and/or sugar and low in nutrients. Moreover, their availability of competitive foods has a negative influence on nutrient consumption, particularly among students from low-income families (Wordell et al., 2012). Availability of these foods is associated with reduced participation in USDA meal programs (Wordell et al., 2012).

Federal regulations prohibit the sale of “foods of minimal nutritional value” in the food service area during school meal periods (O’Toole et al., 2007). Specifically, foods that provide less than five percent of the Reference Daily Intake (RDI) for each of eight specific nutrients (protein, vitamin A, vitamin C, riboflavin, niacin, thiamine, calcium, and iron) per serving or per 100 calories are considered to be of minimal nutritional value (Food and Nutrition Service, USDA, 2012a). The sale of other competitive foods may, at the discretion of the State agency and school food authority, is allowed only if all income from the sale of such foods is used to the benefit of the nonprofit school food services and school or student organizations approved by the school (Food and Nutrition Service, USDA, 1995). However, foods that compete with healthy school meals send mix messages to students, which could undermine nutrition education efforts and discourage healthy eating (O’Toole et al., 2007).

In SC, schools prohibit “foods of minimal value” to be sold as part of à la carte items during breakfast or lunch periods and in vending machines (Centers of Disease Control and Prevention, 2006). Similarly, schools are encouraged, but not required, to prohibit these types of foods in concession stands (Centers of Disease Control and
Prevention, 2006). Schools are also encouraged to prohibit advertising for candy, fast food restaurants, or soft drinks on school property; however, this practice is also not prohibited (Centers of Disease Control and Prevention, 2006). Additionally, student access to vending machines is not allowed for elementary schools and is discouraged in middle and high schools (Centers of Disease Control and Prevention, 2006). Schools also discourage the use of food or food coupons as rewards (Centers of Disease Control and Prevention, 2006).

**School Food Services Staff**

Nationwide, only 75.6% and 77.9% of school districts require newly hired food services directors and managers, respectively, to have a minimum level of education (O’Toole et al., 2007). Some districts require different educational certifications or trainings such as a high school diploma or General Educational Development (GED), an associate’s degree in nutrition or related field, an undergraduate or graduate degree, or a certification in nutrition, related field, or a state licence or endorsement (O’Toole et al., 2007).

South Carolina does not require certifications, licensure, or endorsement for district food services directors or school food services managers (Centers of Disease Control and Prevention, 2006). However, the state does offers professional development opportunities (conferences, workshops, continuing education, graduate courses, etc.) and funding for topics such as competitive food policies to create a healthy food environment, financial management, food safety, healthy food preparation methods, implementation of
the Dietary Guidelines for Americans in school meals, strategies for making school meals more appealing, menu planning for healthy meals, selecting and ordering food, using the cafeteria for nutrition education, and other programs (Centers of Disease Control and Prevention, 2006).

**School Food Services Infrastructure**

Food service operations in the United States typically operate in two ways. School districts that manage all aspects of the administration of school meal programs are considered to be self-operating school food services programs (United States Department of Agriculture, 2011). Conversely, school district can contract a Food Services Management Company to manage a portion of the district’s school meal programs (United States Department of Agriculture, 2011).

Kitchen size, the space for preparations and equipment vary for every school district or school (United States Department of Agriculture, 2011). For example, some school districts are equipped to prepare meals in a central kitchen and deliver them to each school site. Other school districts equip each school with full kitchens to prepare meals onsite (United States Department of Agriculture, 2011).

**Locally Grown Foods**

There is no legal or universally accepted definition of local food (Martinez, 2010). Terms such as “local food,” “local food system,” and “(re)localization” are often used interchangeably to refer to food produced near its point of consumption (Martinez, 2010). For the purpose of this study, local foods can be defined as foods grown within a county,
a state, or even near counties or states (Zepeda & Leviten-Reid, 2004). Additionally, federal, state, and local programs devote significant resources to support local foods because they are expected to generate economic development, health and nutrition, food security, among other advantages (Martinez, 2010).

The expansion of local markets positively influences the local community in the form of income and employment growth. When consumers purchase food locally, sales increase the dollars that stay in the area. This practice can also generate greater economic impacts as workers and businesses spend these additional dollars on production inputs and other products within the area (Martinez, 2010).

Some claims suggest that local foods, such as fresh fruits and vegetables, may provide health benefits from improved nutrition, obesity prevention, and reduced risk of chronic diet-related diseases (Martinez, 2010). Some authors have stated that local food systems offer items that are fresher and retain more nutrients because they travel shorter distances (Martinez, 2010). However, others have proposed that the nutritional quality of food depends on many factors, including growing methods, time elapsed between harvest and consumption, and food preparation methods (Vogt & Kaiser, 2008).

Similarly, it is believed that local foods taste better because they have been harvested within a day or two of consumption, which makes them crispy, sweet, and loaded with flavor. On the contrary, foods that travel longer distances may have higher starch levels, lower cellular turgor pressure, shrunken plant cells, and reduced vitality (South Carolina Food Policy Council, 2011). Coupled with this, local food systems may
increase the availability of healthy foods, such as fruits and vegetables, and encourage consumers within a community to make healthier food choices (Martinez, 2010). Introducing healthy food options in schools may be an effective strategy to improve the diets of children. However, it is unclear if this should be accompanied by other strategies such as an innovative curriculum or cafeteria menu changes to have positive impacts in children’s diet and behavior patterns (Martinez, 2010).

In SC, locally grown fruits and vegetables are identified as “Certified South Carolina Grown.” This is a program among producers, processors, wholesalers, retailers, and the South Carolina Department of Agriculture (SCDA) to brand and promote these state products (SCDA, 2012). The produce identified by the South Carolina Certified logo must be high quality products and grown in SC (South Carolina Department of Agriculture, 2012).

**South Carolina Farm to School**

Currently, there are approximately 2,518 active Farm to School programs in the United States (National Farm to School Network, n.d.). The Farm to School concept was developed in the 1990s from initiatives in Florida and California to address food issues and support local, particularly minority, farmers (Vallianatos, Gottlieb, & Haase, 2004b). The Farm to School initiative is a nationwide program that connects schools (k-12) and local farms with the objectives of serving healthy meals in school cafeterias; improving student nutrition; providing agriculture, health, and nutrition education opportunities; and supporting local and regional farmers (National Farm to School Network, ).
In SC, the Farm to School initiative started as a program called “Grow with Me,” which began in the spring of 2008 in Anderson County. This program was designed to provide schools with a variety of farm fresh produce at any given time. However, “Grow with Me” did not have the proper processing facilities or adequate personnel to meet the demands of the program (Grace, Rubinstein, Schaum, & Vossbrinck, 2009).

During the fall of 2008, the program was re-evaluated and modified to substitute only one menu item at a time. This allowed staff to accurately quantify demand, identify producers able to meet needs, procure products already appropriately processed on the farm, and manage delivery logistics (Grace et al., 2009). Anderson County produce was branded in the school cafeteria, which allowed students to identify locally grown produce easily on the menu with the food on their plates (Grace et al., 2009). Additionally, components, other than serving local foods, were included to reinforce the cafeteria experience. These included farm tours, nutrition and agricultural lessons in the classroom, and cooking demonstrations. Overall, this program served as a model for structuring and implementing a statewide program (Grace et al., 2009).

In 2010, the Centers for Disease Control and Prevention funded a two-year statewide pilot program in SC. The SC Farm to School program is a collaborative effort between the SCDA, the SC Department of Health and Environment Control (DHEC), the State Department of Education (SDE), and Clemson University.

To be eligible for the SC Farm to School Program, schools must participate in NSLP/NSBP and have an Average Daily Membership of 50% or more students who are
eligible for free and/or reduced-priced meals. Schools also must have at least 100 enrolled students. Additionally, schools must agree to: (1) purchase SC grown fruits and vegetables from local sources, (2) provide menus that feature at least two locally grown fruits and vegetables per month, (3) integrate agriculture and nutrition education into the school curriculum, and (4) establish or revitalize a school garden. Fifty-two schools in the state were awarded sub grants of $3,000 each for this program and gardening supplies were also provided.

A successful statewide Farm to School program requires resources and expertise. To develop and maintain an effective infrastructure for a large statewide initiative, such as Farm to School, highly skilled staff with appropriate competencies to plan, develop, implement, and evaluate the Farm to School program were hired. For implementation purposes, the state of SC was divided in three agricultural districts, Lowcountry, Midlands and Upstate. A program coordinator from DHEC and nine regional coordinators, three from each of the partner agencies, were assigned to provide training and technical assistance on Farm to School issues at the local level in each of the regions. Additionally, each regional coordinator visited the schools in their region on a monthly basis.

In general, Department of Agriculture coordinators established relationships with small farmers, provided them assistance through the Good Agricultural Practices (GAP) certification process, encouraged farmers to grow products as requested by school personnel, and developed relationships with major distributors. Similarly, coordinators
from the Department of Education connected local farmers and distributors of local produce with food services directors and provided assistance to school food services staff that included food handling, production, promotion, and procurement procedures. Regional coordinators, hired by Clemson University, assisted teachers in adding Farm to School coursework and activities to current curriculum and schoolwide events.

Program staff also designed a marketing tool called the Palmetto Pick of the Month (PPM). This tool features one fruit or vegetable per month that is grown in SC. The produce items are available during multiple seasons or year-round, however, items are featured during their peak season in most places throughout the state. The PPM allows effective communication of efforts being done by the SC Farm to School program in the classroom, cafeteria, home, and community. Similarly, the tool ensures consistency and allows better coordination of all program activities.

**Farm to School: Cafeteria Component**

Farm to School cafeteria projects are not exactly alike in every school. They may include a range of activities with varying degrees of time and resources, commitment, and involvement (Cornell Farm to School Program, NY Farms, & The New York School Nutrition Association, 2007). In general, the goal of the Farm to School program in the cafeteria is to source, prepare, serve, and promote local foods.

School food services directors and managers are two main stakeholders in the school cafeteria. These stakeholders play an important role in accomplishing the program goals (Cornell Farm to School Program et al., 2007). In general, they are
responsible for serving meals that meet the nutritional requirements set by the USDA within tight budget constraints (Cornell Farm to School Program et al., 2007). Their tasks include decision-making in food procurement, menu planning, staffing, and overall management of K-12 food service operations (Cornell Farm to School Program et al., 2007). Additionally, to accomplish Farm to School program goals, directors need to understand the diversity of the crops grown locally, form and frequency in which they can be delivered, cost of produce, harvest and availability periods, and distributors of local products (Cornell Farm to School Program et al., 2007).

The establishment of a Farm to School Program in the school cafeteria often increases food service expenses (Cornell Farm to School Program et al., 2007). To use local produce, school food services may require additional record keeping, equipment, and preparation than the staff is either used to or equipped to handle (Cornell Farm to School Program et al., 2007). In addition, school food services may need to employ additional workers to wash, cut, and prepare freshly harvested produce before it can be offered in the cafeteria (Joshi & Azuma, 2010).

Food cost is a primary concern of food services directors because food service operations are financed through low meal prices, and state and federal reimbursements (Cornell Farm to School Program et al., 2007). Food services directors need to do price comparisons, talk to distributors and local growers about their financial needs and limits on a per item basis, and consider the financial costs and benefits of sourcing locally
grown foods in the context of the overall food service program (Cornell Farm to School Program et al., 2007).

Food services directors can purchase locally grown produce through several mechanisms; for example, wholesale distributors often look for and highlight local products. This is one resource for farms that do not have a transportation or storage infrastructure (Vermont FEED: Food Education Every Day, 2007). In SC, the main distributors for the Farm to School Schools are Senn Bros, Carolina Produce, Francis Produce, Marvin Produce, and U.S. Foods. Similarly, food services directors can contact the farmers directly. This method takes some time to implement because it requires preparing multiple orders and invoices (Vermont FEED: Food Education Every Day, 2007). School gardens are also a good way of providing fresh fruits, vegetables, and herbs for the school kitchen.

After purchasing local produce, it needs to be incorporated into the school menu. This can be accomplished by introducing a salad bar into the school cafeteria or developing seasonal recipes with local foods. These menus must also provide innovative and easy ways that local, healthy, kid-friendly foods can be incorporated into the school menu (Vermont FEED: Food Education Every Day, 2007). To be effective, school recipes need to be flexible and introduced gradually through taste tests and repeated presentations (Vermont FEED: Food Education Every Day, 2007).

Providing schools with local foods, and promoting and marketing them is a common practice of the Farm to Schools programs in the school cafeteria. This can be
done by highlighting local produce in the school menu, having logos or signs that help identify local produce in the lunch line, holding taste tests, placing informative table tents or flyers in the cafeteria (on tables and in bulletin boards). Similarly, food services staff are encouraged to promote local produce by verbally promoting and contributing to school events. These efforts work best if a schoolwide effort is reinforced by teachers, administration, parents, and food services staff (Vermont FEED: Food Education Every Day, 2007).

In the SC Farm to School program, regional coordinators from the Department of Education are responsible for providing technical assistance to food services directors and managers. These coordinators must provide technical assistance to overcome different issues related to the implementation of the program in the schools of their region, as requested. The assistance provided typically includes sourcing SC produce from distributors or GAP certified local farmers, addressing storage concerns, providing resources and ideas to promote locally grown fruits and vegetables in the cafeteria, and providing training programs for school food services teams about Farm to School practices.

Additionally, the PPM is provided to the food services staff to help them in purchasing and promoting locally grown fruits and vegetables. Marketing materials related to Farm to School, SC Certified Program, and the PPM are also delivered to each school to be used in the cafeteria.
School food services staff and the cafeteria environment play a critical role in the success of Farm to School programs. Understanding the opportunities and challenges is critical to achieving the goal of improving children’s health and minimizing unintended or potentially contradictory outcomes. The goal of this study was to describe the opportunities and challenges of implementing the 2011-2012 SC Farm to School Program in the school cafeteria. Results will provide valuable information to improve the implementation and sustainability of the program in schools interested in Farm to School in the State of SC.

**Research Questions**

a. What opportunities exist in the school cafeteria for implementing the SC Farm to School Program?

b. What are the barriers in the school food environment for implementing the SC Farm to School program?

c. What are the motivators for the school food services staff to implement the SC Farm to School Program in the school cafeteria?

d. What are the concerns and perceived barriers of school food services staff for implementing the SC Farm to School Program in the school cafeteria?
Specific Aims

The specific aims of the present work included the following,

a. Identify opportunities in the school food environment for implementing the SC Farm to School program.

b. Determine the barriers in the school food environment for implementing the SC Farm to School Program.

c. Identify motivators of the school food services staff for implementing the SC Farm to School Program in the school cafeteria.

d. Describe the concerns and perceived barriers of school food services staff for implementing the SC Farm to School Program in the school cafeteria.
III. LITERATURE REVIEW

Several research projects have been undertaken to understand how to increase fruit and vegetable intake. School-based programs have shown modest, but consistent, increases in total fruit and vegetable consumption (Blanchette & Brug, 2005; French & Wechsler, 2004; C. L. Perry et al., 1998). These projects have been built on the assumption that fruits and vegetables have important health benefits for children and adolescents during their period of growth and development when they form eating preferences and habits that are maintained into adulthood (Knai et al., 2006).

The literature reports a range of interventions and programs that promote fruit and vegetable intake among children. The National Cancer Institute and the Produce for Better Health Foundation initiated the 5-A-Day for Better Health campaign. Coupled with this campaign, other programs such as Girls Scouts eat 5, 5-a-day Power Play Campaign, 5-a-day Power Plus Program, Gimme 5, High 5 project Fruit and Vegetables Make the Marks, The Eat 5 badge, and 5-a-day Cafeteria Power Plus project have also been created (Blanchette & Brug, 2005; Knai et al., 2006). In 2007, the 5-a-Day campaign was changed to a new public health initiative “Fruits & Veggies- More Matters” to encourage the consumption of more than five fruits and vegetables a day (CDC, n.d.). The USDA also encouraged the consumption of fruits and vegetables among children with the Fruit and Vegetable Program (Buzby, Guthrie, Kantor, & Assistance, 2003).
The interventions reported in the literature consist primarily of multiple components (e.g., classroom curricula, food services, parental involvement, etc.) that address individual and environmental actions to encourage the consumption of fruits and vegetables (Blanchette & Brug, 2005; Te Velde et al., 2008). Individual-level interventions require engagement of target audience members and typically focus on changing individual knowledge, motivations, and behavioral skills (French & Wechsler, 2004). On the other hand, environmental components focus on changes in the availability or price of fruits and vegetables, mass media or other promotion campaigns, and social influence (French & Wechsler, 2004).

Authors suggest that a positive environment for fruit and vegetable consumption for school children includes the following, (1) increasing access to fruits and vegetables through targeted government subsidies of production, (2) promoting agricultural policies that support healthy diets, (3) supporting access to affordable fruit and vegetable markets, (4) providing adequate funding and policies for schools to provide a suitable school food services including local fresh fruit and vegetables, (5) and reducing access to ‘food of minimal value’ in schools (Gonzalez, Jones, & Frongillo, 2009; Knai et al., 2006; Story et al., 2009).

Blanchette et al. (2005) stated that availability, accessibility, and taste preferences for fruits and vegetables are the most important determinants of fruit and vegetable consumption among children and adolescents. Additionally, Knai et al. (2006) mentioned an intervention of at least 12 months and increased exposure to fruit and
vegetables across the whole school community as important factors for the success of interventions in the school setting. This includes teacher training, a curriculum that integrates nutrition and fruits and vegetables, leadership and encouragement by peers and school food services staff, and parent involvement at school and home (Knai et al., 2006). In addition, many researchers have found that media and marketing campaigns are major strategies to deliver key messages to children. Such campaigns include stations in the cafeteria with information on program events and educational materials, signs, posters, table tents, and public service announcements (Knai et al., 2006; Nicklas & O’Neil, 2011).

Conversely, marketing of fast food, poor access to fruits and vegetables, high cost and inconsistencies in taste are the main environmental barriers to changing children and adolescent consumption of fruits and vegetables (Knai et al., 2006; Nicklas & O’Neil, 2011). Other barriers include an increasingly crowded curriculum where nutrition is not a priority, interventions perceived as too demanding, and insufficient support because of poor coordination and communication between actors (Knai et al., 2006).

Specifically, in the food service area, school meal modification components that target fruits and vegetable consumption usually include an increase in availability and variety, improved taste and portion size, increased acceptability and appeal of fruit and vegetable recipes, and food services staff training (Blanchette & Brug, 2005; French & Wechsler, 2004; Knai et al., 2006; Nicklas & O’Neil, 2011; Schwartz, 2007). Researchers have also found that successful programs encourage food services staff to
conduct promotional activities such as taste tests, verbal prompting, and signage in the school cafeteria (French & Wechsler, 2004; Schwartz, 2007).

The availability and accessibility of fruits and vegetables is associated with produce consumption among children (Blanchette & Brug, 2005). Evidence shows that fruit and vegetable intake can be improved through increased availability and accessibility and frequent exposure to positive social contexts (Blanchette & Brug, 2005). According to French et al. (2004), the simple availability of fruits and vegetables may not be sufficient to prompt the choice of these targeted items when other high fat or high sugar items are also available (Blanchette & Brug, 2005; French & Wechsler, 2004).

Increasing the amount of fresh fruits and vegetables in school meals requires more space to store, prepare, and refrigerate foods (Buzby et al., 2003). In addition, more skill is needed to prepare them, which makes associated costs higher (Buzby et al., 2003). In the Fruit and Vegetable Pilot Program (FVPP), 39% of schools bought pre-prepared trays to control labor costs and handle storage limitations. Juice was also offered in 22% of the schools (Buzby et al., 2003). Many schools found it difficult to pay for additional labor and still stay within their budgets. As a result, schools often switched to higher cost produce items, such as prepared trays or sought additional assistance to help school staff with the foods (Buzby et al., 2003). The FVPP reported that, of 105 schools, 90 used nonteaching staff prepare and serve fruits and vegetables, 63 used teachers to help, 71 used students to help, and 18 used parents to help (Buzby et al., 2003).
Serving a variety of fruits and vegetables with repeated exposure of these foods can accomplish changes in children’s food preferences (Blanchette & Brug, 2005). With the FVPP, apples and bananas were the highest on school shopping lists (Buzby et al., 2003). Additionally, the appeal and taste of fruits and vegetables in the cafeteria was cited by students as their primary motivation to consume these foods (Buzby et al., 2003). Preparation methods that maximize preferred sensory qualities (juiciness, color, bite-size portions, accompanied by a dip or sauce) and vegetables and fruits served along with preferred foods and flavors increases intake (Blanchette & Brug, 2005). Most of the schools that participated in the FVPP bought precut or preprepared items or served dips, nuts, or small side condiments to compliment the fruits and vegetables. According to site visit observations of the FVPP, dried fruit seemed to be less popular with children than fresh fruit and vegetables (Buzby et al., 2003).

**Farm to School: Food Services Impacts**

Nationwide support for Farm to School programs is increasing; however, evaluation reports and research articles have stated different impacts of these programs in the food service area. The success of the Farm to School program not only facilitates changes to overall food service operations but also improves knowledge, awareness, and interest of food services staff toward foods agriculture and healthy recipes (Joshi & Azuma, 2010). Joshi, Misako, and Feenstra (2008) mentioned that if not for the day-to-day work and communication of food services personnel with children, dietary behavioral impacts on students would not be positive.
Procurement

The procurement process is a main change in food service operations as a result of the Farm to School program. Results from the 2004 Michigan Farm to School Survey reported that 73% (n = 383) of respondents expressed interest in purchasing food directly from a local farmer if the source was available and price and quality were competitive (Izumi, Rostant, Moss, & Hamm, 2006). Participating schools have changed their procurement patterns to incorporate local products. Studies indicate that school food services directors purchase locally grown food directly from farmers (Izumi, Alaimo, & Hamm, 2010; Izumi, Wright, & Hamm, 2010; Joshi & Azuma, 2010). According to the 2010 Farm to School Survey of Minnesota, 70% (n = 123) of the districts purchased locally grown produce directly from the farmer (Institute for Agriculture and Trade Policy & Minnesota School Nutrition Association, 2011).

Others purchase food through regionally-based distributors who buy and sell food from regional-level or national vendors that offer locally grown products (Izumi et al., 2010; Joshi & Azuma, 2010). According to the 2010 Farm to School Surveys of Minnesota and Missouri, 78% (N=123) and 22.6% (N=421) respectively, purchased locally grown products from vendors or distributors (Institute for Agriculture and Trade Policy & Minnesota School Nutrition Association, 2011; McKelvey, 2010).

Some districts have reported combining both methods to purchase locally grown produce (Institute for Agriculture and Trade Policy & Minnesota School Nutrition Association, 2011). Similarly, school districts use other strategies to incorporate locally grown fruits and vegetables into the school cafeteria. Winters Joint Unified School
District in California used a combined procurement system where they purchased from local farmers and sourced directly from an organic school garden (Joshi & Beery, 2007). In the Los Angeles Unified School District, California, the program paid Tierra Miguel, a local organic farm, to produce for that particular district (Haase & Azuma, A., Gottlieb, R., & Valliantos, M., 2004).

According to the results from the 2004 Michigan Farm to School Survey, the main motivations of food services directors in serving locally grown foods include support of local economy and local community, access to fresher and higher-quality food, good public relationships, and ability to purchase in small quantities (Institute for Agriculture and Trade Policy & Minnesota School Nutrition Association, 2011; Vermont FEED: Food Education Every Day, 2007). Similarly, directors have reported other motivators to buy local produce such as having a central place to order from multiple farmers, financial incentives for making local purchases, assurances of food safety, and rules that make it easier to purchase from local farmers (McKelvey, 2010).

The major concerns expressed by food services directors about purchasing locally grown products include cost, reliability of supply, seasonality of fruits and vegetables, food safety, and delivery and quality of the produce (Izumi et al., 2006). In addition, federal and state procurement regulations, lack of products available during certain times of the year, and lack of producers in the area from whom to purchase are the main barriers that prevent food services directors from buying foods directly from farmers (Izumi et al., 2006; McKelvey, 2010; Vermont FEED: Food Education Every Day, 2007).
Food Cost

Regarding locally grown produce costs, according to the 2004 Michigan Farm to School Survey, 10% of respondents (n = 383) indicated a willingness to pay higher prices for local foods, while 43% were neutral on the price, and 45.5% of directors were not willing to pay higher prices (Izumi et al., 2006). Directors claimed that food purchased through a mainstream distributor imposes additional costs for transportation and handling of produce as opposed to shortening the supply chain by buying directly from the farmer (Izumi et al., 2006).

Food services staff have taken advantage of perishable products that farmers were not able to sell in other market outlets. Because these perishable products need to be sold quickly, they are sold at low prices (Izumi et al., 2006). In addition, the Missoula County Public School District found that buying some local foods in season was either less expensive or comparable to the costs of purchasing foods through broadline suppliers (Dillon & Harris, 2007). Similarly, directors claimed that, although foods bought directly from farmers had higher prices, the price per serving was lower compared with produce bought from a broadline distributor (Izumi et al., 2010). This is due to the quality of the products, which produced less food waste (Izumi et al., 2010).

Directors have also expressed that buying local produce through their vendors, a cooperative, or the Department of Defense minimizes logistical concerns such as ordering, billing, and delivery that have been associated with purchasing local foods directly from farmers (Izumi et al., 2006; Vallianatos, Gottlieb, & Haase, 2004a; Vallianatos, Gottlieb, & Haase, 2004b). Buying locally grown food through an
intermediary may also decrease the cost for schools because vendors may be able to buy larger quantities at discounted prices (Izumi et al., 2006).

**School Food Services Infrastructure and Staff**

Integrating SC produce into the school cafeteria requires a modest initial financial investment for equipment at each school site (Joshi & Azuma, 2008; Joshi & Azuma, 2010). Many schools do not have kitchens with equipment or the space to process and store foods (Schmidt, Kolodinsky, & Symans, 2006). The Ventura Unified Farm to School Program reported start-up costs in the range of $3,400 to $7,000 per school site to buy equipment such as child-size salad bars or extra refrigerator space (Joshi & Azuma, 2010).

Similarly, school food services may need to employ additional staff to wash, cut, and prepare fresh produce before it is served in the cafeteria line. Food services staff have reported a consistent need to work overtime to complete all the duties to prepare a salad bar, including an estimated 30 additional minutes for cleanup duties (Graham, Feenstra, Evans, & Zidenberg-Cherr, 2004).

**Incorporating Fruits and Vegetables into the Menu**

Another challenge of the Farm to School Program is to increase the variety and quantity of fruits and vegetables offered to students. The incorporation of a salad bar has been a primary strategy in this effort. The Winters Joint Unified School District in California implemented a farm fresh salad bar, which allowed the district to serve 107% and 177% of the recommended daily servings of fruits and vegetables, respectively (Joshi & Azuma, 2010).
The Davis Joint Unified School District in California started to offer the choice between salad bar and hot entrée every day during the 2000-2001 and 2001-2002 school years (Graham et al., 2004; Joshi & Azuma, 2010). During these years, eight of the schools offered only salad bar as the meal every day, that included protein, bread and milks adhering to USDA requirements. In the 2004-2005 school year, an average of 105% of the recommended daily serving of fruits and vegetables were served during lunch (Joshi & Azuma, 2010).

Initially, it was thought that increasing the number of schools and the volume of local product served would even out the costs of the school salad bar. However, the expansion of sites and increase in labor and equipment costs were prohibitive (Joshi & Azuma, 2010). To reduce these costs, a central kitchen, with the capacity to package a number of salads per day, was established (Joshi & Azuma, 2010). The packaged salads included some local produce. During the 2005-2006 school year pre-packaged salads were offered daily to the eight elementary schools along with a hot entrée (Joshi & Azuma, 2010).

Another common activity to incorporate locally grown produce into the cafeteria consisted of the development of seasonal recipes that incorporate local foods (Market Ventures, Inc., Karp Resources & The Center for Health & Public Service Research at New York University, 2007). Kitchen staff have tried new ways of incorporating raw vegetables into sandwiches and have found new ways of incorporating local foods into the menu (Vermont FEED: Food Education Every Day, 2007). During the School Food
Plus Program in New York City, kitchen staff developed plant-based recipes that included local vegetables, legumes, grains, and fruits, and were prepared in the school kitchen and introduced in the school cafeteria (Market Ventures, Inc., Karp Resources & The Center for Health & Public Service Research at New York University, 2007). By the end of the 2004-2005 school year, 32 recipes were created, tested, and served as part of the school menu cycle (Joshi & Azuma, 2010). As a result of this, food services directors from the Upper Midwest and Northeast regions of the United States mentioned that children liked locally grown food items that were added to the menu (Izumi et al., 2006). Similarly, staff from the Davis Unified School District saw an overall positive effect on student’s diets and children were excited about having salad as a lunch option (Graham et al., 2004). In addition, the Burlington School Food Project reported that students found local fruits and vegetables to be tastier than other produce that students were used to eating (Schmidt et al., 2006).

**School Meal Participation**

School meal participation rates increased when Farm to School programs were implemented (Joshi & Azuma, 2010). In several schools, this increase occurred after salad bars were introduced as part of their Farm to School Program. For example, the Davis Joint Unified School District reported increased participation in school meal programs from an average of 32.4% compared to 26% before the salad bars were introduced (Joshi & Azuma, 2010). The student lunch participation at the Farm to School program in the Ventura Unified School District rose from 50% to 56% over the first two years of implementation of the Farm to School Program (Joshi & Azuma, 2010).
Jefferson Elementary School, in Riverside California, reported increased participation rates by 4% for students who received free lunches, 5.3% for students who received reduced price meals, and 8.5% for paid lunches (Joshi & Azuma, 2010). Similarly, participation at Abernethy rose by 3% after one year of program implantation (Joshi & Azuma, 2010). Additionally, reports in the literature show that, after initial excitement about the new program wears off, meal participation rates generally level off at a rate that is still higher than before program implementation, provided the quality and price of the meal is not compromised (Joshi & Beery, 2007).

**Marketing and promotional activities**

Buying power of children and adolescents has increased exponentially over the years (Calvert, 2008). As such, marketers use a variety of techniques to attract this audience and increase product purchases (Calvert, 2008). Farm to school programs have conducted a variety of social marketing activities, such as taste testing events, posters, point-of-purchase displays and signs, and trading cards (Market Ventures, Inc., Karp Resources & The Center for Health & Public Service Research at New York University, 2007).

Edmunds school encouraged food-related student artwork in the school cafeteria. Twenty-four large panels depicting Vermont milk, mesclun, strawberries, squash, and more, were painted by 70 sixth, seventh, and eighth grade students. Ten additional panels were created by 90 elementary students (Vermont FEED: Food Education Every Day, 2007).
School have also implemented test tastings in the cafeteria with the intention of exposing children to more fruits, vegetables and seasonal products and to integrate well-liked and feasible items into the regular lunch menu over time. As part of the School Food Plus Program in New York City, nine taste testing events were held over the course of the year; a total of 3,475 votes were cast by children (Market Ventures, Inc., Karp Resources & The Center for Health & Public Service Research at New York University, 2007). Similarly, during the 2006 Burlington School Food Project, Edmund and Hunt middle schools reported 37 and 20 different items tested and 6,300 and 3,500 tastings developed, respectively (Schmidt et al., 2006). Three quarters (74%) of students who tried foods at the taste tests said the food was new to them and 43% reported their willingness to try more new foods because of their experience with the taste tests (Schmidt et al., 2006).
IV. METHODOLOGY

Study design

The present study used a cross-sectional survey design to gather information about the opportunities and barriers in the school food environment as well as motivators, concerns, and perceived barriers for implementing the Farm to School program according to the perceptions of food services directors and managers of participating school during the 2011-2012 SC Farm to School Program.

Population

The population under study was school food services staff of 52 participating schools during the 2011-2012 SC Farm to School Program. This included directors from 27 school districts (9 from upstate, 12 from midlands, and 6 from low country). A total of 49 food services managers participated in the program (15 from upstate, 16 from midlands, and 18 from low country). Of note, while 52 schools participated in this study, there were not 52 food services managers, rather some manages worked in more than one school; for example, one individual may manage the food services department at an elementary, middle, and high school.
Theoretical framework

This study used the ecological approach to assess program implementation in the school cafeteria of schools that participated in the SC Farm to School Program. Surveys included questions related to all three levels of this approach. Intrapersonal level variables included knowledge of SC grown fruits and vegetables, skills of the food services staff for preparing fresh fruits and vegetables, attitudes, motivations, and perceived barriers to implementing the program. Social and cultural environmental questions were related to the regulations associated with the school food environment, modeling of eating behaviors by school personnel, and collaboration of the school food services staff in classroom learning experiences. Lastly, physical environmental questions related to school kitchen facilities to increase the usage of SC fruits and vegetables that are available and advertising in the school cafeteria.

Survey development

The development of an assessment survey for the SC Farm to School program directors and managers began in spring 2011 with a literature review to identify the opportunities and barriers in the school food environment and the motivators, concerns, and perceived barriers for implementing the Farm to School program. Surveys used in Farm to School programs in Michigan, Minnesota, Missouri, New Mexico, New York, North Carolina, Northeast, Oklahoma, and Virginia were found and used as a foundation. To ensure content validity, questions used in this study were based on surveys used in previous related research. As a result, two self-administered surveys, one for school food services directors and one for the school managers, were adapted for use.
Questions specific to the SC Farm to School program were added to the surveys. These questions were related to the technical assistance of the regional coordinators, knowledge about SC grown fruits and vegetables, and the Palmetto Pick of the Month marketing tool. To gain general knowledge, the regional coordinators of the Department of Education were asked about actions resources provided to food services staff as part of the efforts of the SC Farm to School program. This information was used in the development of survey questions.

For school food services directors, a 12-question survey was developed to assess knowledge of SC grown fruits and vegetables, perceived assistance, and usefulness of the assistance provided by the regional coordinators. Questions also addressed motivations, concerns, and perceived barriers for implementing Farm to school programs. These questions were related to the process of purchasing locally grown produce for schools.

The food services managers’ survey consisted of 32 questions. The instrument assessed the school food environment in terms of food regulations and school facilities to store, prepare, and serve fresh fruits and vegetables. Questions also addressed perceived familiarity, awareness, support, and skills of school food services staff with SC Farm to School program activities. Lastly, questions addressed perceived assistance and usefulness provided by regional coordinators, manager motivations, and perceived barriers for implementing farm to school programs, in terms of storing, preparing, serving, and promoting locally grown produce.
Most questions were close-ended and required little time investment. Participants chose their answers from closed-choice items such as multiple choice and categorical questions (e.g., mark all that apply, yes/no, etc.) and Likert-scale type questions where participants selected from a list of potential answers (e.g., small extent, moderate extent, large extent, etc.). In addition, open-ended questions were included. Open-ended questions do not give respondents answers to choose from, rather are phrased so respondents have the opportunity to explain their answers and reactions to the question in a sentence, a paragraph, or even a page or more, depending on the survey. These questions gathered demographic information and more detailed data on strategies used to promote local produce and specific trainings to gain and improve skills to store, prepare, serve, and promote fresh fruits and vegetables. One or two of this type of question were included because they can be time consuming and require more effort by the participant.

To increase validity, the surveys were reviewed by the program coordinator and two members of the evaluation team for the SC Farm to School program. Modifications were made to both surveys and the instruments were uploaded online through Qualtrics Online Survey Software (Qualtrics Labs Inc., Provo, UT). After the surveys were uploaded, they were sent to a small sample of food services directors who did not participate in the program, but who serves as pilot test participants for readability and clarity.

Six food services directors completed the survey online during the pilot test and minor changes were made to both instruments according to findings and directors’
suggestions. The evaluation team and an expert on survey development completed another revision. An final revision was completed by the Department of Education regional coordinators and the State Farm to School program coordinator. After this revision, both surveys were finalized (Beecham, Hall, Britton, Cotte, & Rainer, 2005; Keeney, Hasson, & McKenna, 2001).

**Data collection**

Before sending the surveys to participants, approval was obtained from the Clemson University Institutional Review Board (IRB). To maximize response rate, three data collection methods were used for each survey: (1) online survey, (2) distribution by the regional coordinators, and (3) mailings to the directors and managers who did not reply through the other methods. Additionally, phone surveys were conducted with school food services directors. Because this population has many of time constraints, a Walmart gift card was offered as an incentive to those who completed the survey.

In April 2012, the surveys were emailed through Qualtrics Online Survey Software to all managers and directors with an invitation letter explaining the purpose of the study, the incentives provided if they replied to the survey, and the confidential nature of the responses. A weekly reminder was sent to participants who did not reply to the survey for a period of one month.

In May 2012, paper surveys were given to the Department of Education regional coordinators to be distributed during their monthly school visits for the managers who had not yet participated. Simultaneously, surveys were mailed to the directors and
managers from whom complete answers were missing. Each envelope contained the invitation letter, the survey, and another envelope with the address and return postage. Additionally, school food services directors who did not replied were called every day during the last three weeks of May.

**Data Analysis**

Data from this study were analyzed using JMP® 9 statistical software (JMP, Version 9. SAS Institute Inc., Cary, NC, 1989-2009). Descriptive statistics were drawn to examine the distribution of responses and calculate frequencies and probabilities. Pearson Chi-Square tests were conducted to examine whether the observed proportions for each categorical variable differed from the hypothesized proportions. The level of significance was set at 0.05.
V. RESULTS

A total of 27 surveys were sent to school food services directors and 49 surveys to school food services managers. The overall response rate was 70.4% (N = 19) and 61.2% (N = 30) for school food services directors and managers, respectively. The most common response method used by directors was the online version (52.6%) followed by phone survey (26.3%) and mail survey (21.1%). On the other hand, the most common response method used by the managers was the mailed survey (53.3%) followed by the online version (46.7%).

Most directors from participating schools claimed to have self-managed food services (84.2%), which only a few were contract managed (15.8%) by companies such as Chartwells and Sodexo. According to managers, most schools did not have restrictions for food sold in vending machines (70%). A significant majority of the respondents mentioned that they did not have any regulations for competitive foods sold in the cafeteria (77.3%) or for food sold in fundraisers (78.2%) (see Table 2). However, some managers (30%) claimed that their schools did not allow vending machines for students. Regarding competitive foods, managers mentioned regulations such as no outside food (e.g., McDonalds, Subway, etc) or no competitive foods sold in the school cafeteria at lunchtime. A few respondents expressed that their school had restrictions for foods allowed in fundraising activities and only one manager specified that the school did not allowed doughnuts.
A significant majority of managers (86.7%, Pearson Chi-square test p < 0.0001) expressed that activities were implemented in their schools as part of the 2011-2012 SC Farm to School Program. However 6.7% (n = 2) mentioned that no activities related to the program were implemented and 6.7% (n = 2) were not sure. From the managers who mentioned that activities were implemented at their schools (n = 26), 34.6% claimed that they were very familiar with the activities, 46.2% were familiar, and 19.2% were somewhat familiar (see Table 3). In addition, 26.9% of managers believed their staff was very aware of the activities implemented as part of the program, 38.5% of staff were aware, 30.8% were somewhat aware, and 3.8% were not aware (see Table 4). In general, a significant majority of managers perceived that the food services staff was very supportive of the program (63.3%; see Table 5).

Additionally, of school food services managers, 40% stated that their school participated in programs other than Farm to School to increase fruit and vegetables consumption among children. The USDA Fresh Fruit and Vegetable Program was the most popular among these supplemental programs (26.7%). Other programs included the United States Healthier School Challenge and Chef to School. The US Healthier School Challenge (HUSSC) is a voluntary certification initiative that was established in 2004 to recognize schools that participated in the National School Lunch Program and have created healthier school environments through the promotion of nutrition and physical activity (USDA, 2012). Similarly, Chefs to School is an integral part of the “Let’s Move!” initiative where chefs play a major role in creating healthy eating habits by providing schools with hands-on taste testing and cooking demonstrations.
Regarding knowledge of school food services directors concerning fruits and vegetables grown in SC, a significant majority described themselves as knowledgeable (63.16%; see Table 6). Directors were asked to choose SC grown produce from a list 30 of different fruits and vegetables; the list included the 12 Palmetto Picks of the Month, 8 additional SC grown fruits and vegetables, and 10 products that are not commonly grown in the state. A significant majority of directors identified 11 of the 12 Palmetto Picks. Even though 68.4% of the directors claimed winter squash was grown in SC, this was not a significant majority (see Table 7). Additionally, a significant majority of directors identified seven of the other SC products. A significant majority did not mark celery as a SC grown product, even though it is grown in the state. Few marked the non-SC grown fruits and vegetables as being grown in the state. For example, yam (79.8%) and kiwi (31.6%) were products marked the most from this category. Incidence of food services directors selecting yam as a SC-grown vegetable was significantly greater than those who did not select it (see Table 8).

A significant majority of managers believed their current food services had sufficient staff to handle an increase in unprocessed fresh fruits and vegetables (62.1%) and partially processed (53.5%) to a moderate extent (see Table 9). On the other hand, the time to store fresh fruits and vegetables was perceived by a significant plurality of school food services managers as a barrier to a small extent. Even though most managers expressed that time for preparing and serving fresh fruits and vegetables was a barrier to a moderate and small extent, respectively, this was not a significant majority (see Table
When asked about the methods used to serve fresh fruits and vegetables, most indicated pre-made salads (76.7%) compared to a salad bar (23.3%).

Almost 57% of respondents mentioned that, in the past two years, their staff had participated in training program(s) to store, prepare, or serve whole fresh fruits and vegetables. Some examples of these training programs include Safe Serve (training to learn basic food safety practices for preparing and serving food), Project S.I.F.T. (Skill Improvement Foodservice Techniques), Cooking with a Chef, and trainings from specific programs such as the USDA Fresh Fruits and Vegetables and the Healthy Eating Kids Campaign. In addition, schools participated in trainings from vendors such as Carolina produce or others offered by their school districts. Coupled with this, most food services managers thought their staff had the skills to receive, store, prepare, and serve fresh fruits and vegetables. The majority of the food services managers rated staff skills and abilities as excellent or good (see Table 11). However, managers mentioned that additional trainings for preparation techniques and safe handling practices would be helpful for implementing the SC Farm to School program.

Regarding kitchen facilities, a significant majority of managers (53.3%) claimed that they had moderate preparation space to prepare unprocessed and partially processed locally grown fruits and vegetables. On the other hand, most managers expressed they had enough cold and dry storage space to handle fresh fruits and vegetables (see Table 12). In addition, a significant majority reported that they have the necessary utensils (96.7%) and equipment (90.0%) to prepare fresh fruits and vegetables (see Table 13).
When asked about ways SC grown fruits and vegetables are promoted in the cafeteria, a significant majority of managers mentioned that they used posters (86.7%), and fruit and vegetable tastings (70%) (see Table 14). Similarly, most managers (90.0%, Pearson Chi-square test p < .0001) thought that the “Palmetto Pick of the Month” tool was helpful to promote SC grown produce. Other ways to promote SC grown fruits and vegetables mentioned included school menus, announcements, newsletters, and the school website. Similarly, to encourage children to eat more SC grown fruits and vegetables, food services staff said that they had the products available in the cafeteria, they explained to students the nutritional benefits of consuming fruits and vegetables, they asked the students to try the products before they say they do not like them, and they remind students to pick their fruits and vegetables in the cafeteria line. In addition, one manager mentioned that he gave stickers to children as an incentive to consume fruits and vegetables. Other managers held recipe challenges with SC grown produce.

A significant majority of managers (83.3%) perceived that most food services staff supported healthy eating by being role models to the students, followed by teachers (56.7%), and administrative staff (50%) (see Table 15). Additionally, most managers (83.3%, Pearson Chi-square test p < 0.0003) mentioned that food services collaborated with classroom learning concerning SC grown fruits and vegetables. Collaboration consisted mainly of test tastings. A significant plurality developed this activity every month (40%) or twice a year (40%; see Table 16).
Regional coordinators from the Department of Education School provided food services directors and managers with technical assistance. A significant majority of directors and managers mentioned that the coordinators provided them with resources, ideas, and recipes to promote SC grown produce in their cafeterias (89.5% and 78.6%, respectively) and preparation techniques using SC fruits and vegetables (100% and 78.6%, respectively; see Table 17). In addition, a significant majority of managers claimed that they received assistance in sourcing SC products from distributors (75.0%) and local GAP certified farmers (78.6%; see Table 17). Food services directors were also asked their perceptions of the usefulness of this assistance and a significant plurality (42.1%) mentioned that it was very useful. Similarly, a significant majority of managers (64.3%) expressed the same sentiment (see Table 18).

When asked about motivators for implementing the program, a significant majority of directors (94.7%) mentioned access to fresher fruits and vegetables and higher-quality food (see Table 19). It is important to mention that higher student consumption of fruits and vegetables was a motivator for 63.1%; however, this was not a significant majority. Additionally, a significant majority of school food services managers mentioned students eating better at school (83.%) and obesity or overweight rates in children may reduce (80%; see Table 4.19). Some directors (5.3%) and managers (10%) expressed not having any motivators to implement the program (see Tables 19 and 20).
Most directors mentioned that a concern for implementing the program was the inadequate availability due to seasonality (68.4%). Other concerns mentioned were high costs (47.4%) and food safety and handling practices of produce (47.4%; see Table 21). However, a significant majority did not express these concerns. In addition, a significant majority of directors reported that a perceived barrier was a lack of products available during certain time of the year (84.2%) and finding farmers to purchase from directly (73.7%). On the other hand, a significant majority of directors (26.3%) did not perceive the following as barriers, policies in food service contract that prevents or limits purchasing SC grown fruits and vegetables, purchasing local foods might threaten the relationship with their usual vendor (21.1%); or multiple orders and invoices (10.5%; see Table 22). A significant majority of managers did not perceive any barriers for implementing the SC Farm to School program (75%; see Table 22).
VI. DISCUSSION

The response rates for the assessment surveys in this study were higher than that obtained in similar studies (Institute for Agriculture and Trade Policy & Minnesota School Nutrition Association, 2011; Izumi et al., 2006; McKelvey, 2010). Online surveys are gaining popularity because they can be used to obtain information rapidly all throughout the state and are low cost (Evans & Mathur, 2005). Additionally, online surveys are time-efficient and minimize the period it takes to get a survey into the field and collect the data (Evans & Mathur, 2005). The use of online surveys was an efficient method for data collection in this study and almost half of both surveys were answered through the online method. However, using this method alone with this specific population can result in a low response rate. Food services staff might not always have computer or internet access because of the nature of their daily tasks. In addition, districts do not require newly hired food services directors or managers to have a minimum level of education (O’Toole et al., 2007); therefore, they could have limited computer literacy (Evans & Mathur, 2005).

During school visits, the regional coordinators commented and reminded the food services staff about the survey. Similarly, follow-up reminders helped increase the number of completed surveys and were obtained at a low expense. However, sending too many reminders could lead respondents to think of it as spam or junk mail, even if it comes from a legitimate, trusted source (Evans & Mathur, 2005).
To increase the response rate of both surveys, mailed surveys was the second method used because it has similar characteristics to the online version. Printing the surveys, the use of paper, postage, mailing out, and data entry are some of the costs added when using this method (Evans & Mathur, 2005). Coupled with these costs is the amount of days needed to mail the surveys and receive them back, which is a relevant consideration when time is limited. However, this method allowed us to increase the number of completed surveys obtained from food services staff.

Phone surveys are difficult to complete successfully with this population. For this study, phone surveys were conducted simultaneously with the mailed surveys for a period of one month. Few responses were obtained using the phone survey method. This method is not recommended with food services staff because calls frequently needed to be transferred from one person to another or calls was transferred to voicemails instead of the actual person. This increased the time spent for data collection and only resulted in a completed survey in a few instances.

Most directors who completed the survey expressed that their food services were self-managed. The data suggests that self-managed operations are more likely to implement local food systems initiatives compared to contract-managed operations as seen in universities and colleges (Johnson & Stevenson, 1998). This is likely to happen because they have more autonomy and flexibility to establish and maintain relationships with local vendors than their contract-managed counterparts (Hinrichs, Schafft, & Center for Rural Pennsylvania, 2009; Johnson & Stevenson, 1998).
Food that is available at schools as part of the NSLP/NSBP must meet federal standards. Recently, the standards had been changed to align with the 2010 Dietary Guidelines; mandatory compliance with this new federal rule must begin after July 1, 2012. In summary, the new rule sought to improve lunch and breakfast by requiring schools to offer fruits and vegetables as two separate components, offer fruit daily at breakfast and lunch, offer vegetables daily at lunch including specific vegetable subgroups, limit the quantity of starchy vegetable subgroups throughout the week, and require students to select a fruit or a vegetable as part of the reimbursable meal (Food and Nutrition Service, USDA, 2012b). Similarly, 100% juice can be offered; however, no more than half of the per-meal fruit component may be juice because it lacks dietary fiber and, when consumed in excess, can contribute to extra calories (Food and Nutrition Service, USDA, 2012b). The new standards also encourages offering fresh fruits and vegetables (Food and Nutrition Service, USDA, 2012b). The new rule is an opportunity to strengthen Farm to School Programs because it is aligned with the program goal of increasing fresh fruits and vegetables on the school menu.

Additionally, there is a need to improve the foods sold in vending machines, as well as competitive foods in the school cafeteria and foods allowed in fundraisers. A significant majority of schools that participated in the 2011-2012 SC Farm to School Program did not have any regulations for competitive foods sold in the cafeteria or for foods allowed in fundraisers. In addition, many schools did not have any restrictions for foods sold in vending machines. Evidence suggests that reducing access to unhealthy food at school leads to reduced sales of those items and increased consumption of
healthful foods such as fruits and vegetables (Larson & Story, 2010). Other studies have found that, among middle school-age children, the availability of vending machines that sell low-nutrient, energy-dense foods in or near the cafeteria is associated with higher BMI z-scores (Fox, Dodd, Wilson, & Gleason, 2009).

Strategies to improve competitive foods in school should be considered as part of the Farm to School programs. A recent study explored the extent to which school children purchased precut and bagged fruits and vegetables from a mobile fruit vendor “frutero” (Tester, Yen, & Laraia, 2012). Tester et al. (2012) found that for every successive day, an average of one additional bag of fruits and vegetables was sold by the “frutero” and 1.5 fewer non-nutritious foods was sold by a competing vendor. Other innovative and creative actions can be considered to improve the school food environment.

The 2011-2012 SC Farm to School program should take advantage of other programs that some schools participate in to increase fruit and vegetable consumption. For example, 26% of schools participate in the USDA Fruit and Vegetable Program and the USDA awards grants for the purchase of fruits and vegetables to schools that participate in this program. However, subgrants provided to schools as part of the SC Farm to School Program could not be used to purchase fruits or vegetables that are sold in the cafeteria. Therefore, schools that participate in both programs could alleviate, if any, budget constraints to purchase fruits and vegetables from local sources. In these cases, additional efforts to connect local farmers or distributors of local foods with food services directors are recommended to accomplish both programs’ goals.
The majority of school food services managers expressed that their schools engaged in activities related to the Farm to School program and were very supportive of the program. In addition, participants perceived that they were familiar and staff was aware of the activities that took place in their schools. Active participation and encouragement by school food services staff has been associated with significantly higher intake of fruits and vegetables among children (C. L. Perry et al., 2004).

Knowledge is an important means to shape and reinforce attitudes (Zepeda & Deal, 2009). A significant majority of school food services directors perceived that they were knowledgeable of fruits and vegetables grown in SC. After having directors select from a list of SC grown and non-SC grown fruits and vegetables, a significant majority identify most SC grown fruits and vegetables. According to Zepeda and Deal (2009), knowledge influence consumers’ organic and local food purchases (Zepeda & Deal, 2009).

Managers perceived that they had enough staff, time, and preparation space to handle an increase of fresh fruits and vegetables to a moderate extent. The fact that many participating schools use pre-made salads and other pre- prepared foods (e.g. trays) is helpful to overcome this challenge. Directors can also consider avoiding labor-intensive foods or serving some as whole fruits or vegetables. They could also modify menus when local fruits and vegetables are available to accommodate the increased processing requirements for these items and decrease the amount of other items that require similar hours to be prepared such as baked items.
The Burlington School Food Project involved community members and parents of school children as volunteers to help with Farm to School related activities (Schmidt et al., 2006). Some Farm to School programs have used this strategy to provide additional help to school food services staff when preparing and serving local foods. However, this requires training on proper food handling techniques (United States Department of Agriculture, 2011). Extra efforts are needed to build partnerships with local professionals who could provide volunteers with the knowledge and skills to meet the needs of school food services staff.

Even though school food services managers perceived their staff as having the skills and abilities to prepare fresh fruits and vegetables, several mentioned they were interested in learning new skills and preparation techniques to prepare fresh fruits and vegetables. This can be done by enrolling staff in trainings from the National Food Service Management Institute, National Restaurant Association, or the School Nutrition Association. Similarly, because Clemson University is a partner of the program, the university could help connect participating schools with the Cooking with a Chef program to provide these trainings.

The school food services staff works to promote SC Grown fruits and vegetables. Most importantly, they actively encourage students to try fresh fruits and vegetables. Main strategies used by participating schools included posters and holding taste tastings. These are good strategies because they are fun and hands-on, in the case of taste tastings, which accomplishes the goal of connecting children to healthy food. In the future, food services staff can promote fruits and vegetables by using materials with nutrition
information for products served in the cafeteria, bulletin boards, table tents, newsletters, or techniques such as creative garnishing. Staff could also work with teachers to connect marketing strategies with classroom learning activities such as writing articles so the school and community can learn about the produce offered in the lunch program. In addition, food services staff could hold an artwork or recipe contest related to SC grown produce to improve the school cafeteria environment.

School food services staff, teachers, administrators and school employees are key target groups for improving school nutrition. School personnel educate children on healthful eating in the classroom and serve as role models. In this study, food services managers from participating schools perceived that school personnel were always supportive of healthy eating by being role models to the students. However, more research is needed on this subject because the methods used in this study included only the perceptions of the school food services managers.

Most food services staff collaborated with classroom learning via taste tastings that were conducted monthly or twice a year. This is a good experience for students as indicated by some respondents who mentioned that some children have never tried the fruits and vegetables offered at school. Most children will want to try a bite of something before they commit to an entire serving (Vermont FEED: Food Education Every Day, 2007). Coupled with this, a child may have to try a new food several times before she or he accepts it (Vermont FEED: Food Education Every Day, 2007). In addition, taste tests familiarize children with new foods, which can help ensure that the item is marketable
before it is offered on the menu; this way food waste can be prevented (Vermont FEED: Food Education Every Day, 2007).

Cooking demonstrations were not used by a significant majority of food services staff (50%) in the 2011-2012 SC Farm to School program. It is recommended to encourage school food services staff to get involved with this type of activity and collaborate with classroom learning. When children cook, they develop pride and confidence in their skills and abilities. Additionally, learning a skill such as cooking encourages self-direction, develops cognitive problem solving skills, develops small muscle control and hand-eye coordination, and promotes social-emotional development. This is also a good opportunity to feature local foods connecting them to the class curriculum in areas such as mathematics, arts, science, social studies, and literacy.

One strength of the 2011-2012 SC Farm to School program was the regional coordinators who provided technical assistance to school food services staff. These coordinators provided assistance during the monthly school visits and when requested. It is important to highlight that no director or manager who participated in this study marked they did not received technical assistance. As shown in the results, many school food services managers expressed receiving assistance on sourcing SC products from distributors and local GAP certified farmers. This was different from what was expected because school food services directors are usually responsible for the procurement process. Both directors and manager expressed receiving assistance on resources and ideas to promote SC products and recipes and preparation techniques. These two aspects should be considered to increase the sustainability of the program.
When asked about the usefulness of the technical assistance that regional coordinators provided, a higher percentage of managers thought the assistance was useful in comparison to that reported by directors. However, a significant majority of both directors and managers thought the assistance was very useful. A few directors expressed that they were being monitored instead of being helped to implement the program. It is recommended to continue with a similar staff structure in the future. Regional coordinators play a crucial role in helping schools overcome barriers and sustaining the program. Because these coordinators have contact with Farm to School programs statewide, they can offer relevant recommendations on different activities that schools implement and help school avoid common drawbacks (Derwingson, 2008). In addition, because of their position within a larger state agency, coordinators can link schools to a greater body of resources that state agencies might provide (Derwingson, 2008).

The motivation for most directors to purchase local products was the access to fresher fruits and vegetables and higher quality of food. The knowledge of their motivations to purchase and serve SC grown produce is useful to encourage other schools that want to participate in the program and increase use of local foods. However, more effort is needed so that directors’ motivations to purchase these products is driven by a higher consumption of fruits and vegetables by the students. On the other hand, the managers’ motivations were to give students the opportunity to eat better at school and to reduce obesity and overweight rates in children. These motivations are aligned with the program goals of increasing students’ consumption of fruits and vegetables.
Different to what was expected; a significant majority of school food services managers expressed no barriers to implementing the 2011-2012 SC Farm to School program. On the contrary, when purchasing SC grown products, most directors were concerned about having an inadequate availability of the produce due to seasonality. A significant majority of directors also mentioned this as a barrier to implementing the program. The Department of Agriculture provides a “Produce Availability Calendar” for SC grown products, which is located on the department’s website. This tool is useful when planning school menus as planners can avoid conflicts between the menu and purchasing because of seasonal items. In addition, regional coordinators developed the “Palmetto Pick of the Month,” which highlights a product that is available each month. More effort is needed to increase directors’ awareness of these tools. Other recommendations to avoid these barriers include conducting procurement well enough in advance for local farmers to prepare their crops for the school’s needs (United States Department of Agriculture, 2011). Additionally, if a local producer is unable to provide the needed quantity, directors can supplement this item with products from a contracted distributor or other local producer (United States Department of Agriculture, 2011).

Finding farmers to purchase from directly was another barrier mentioned by a significant majority of directors. Bruno (2009) found that directors are interested in purchasing local foods, but do not know how to contact farmers for various products. Finding farmers who are GAP certified and have the liability insurance required to sell produce to the schools increases the workload of the school food services directors (Bruno, 2009). Efforts have been made by regional coordinators to help farmers become
GAP certified. However, motivating farmers and guiding them is a process that takes time. Overcoming this challenge will simply require continued work between the regional coordinators and farmers. In addition, a Farm to School directory that provides information of certified farmers and available products is necessary to improve communication between farmers and school food services directors. Contact information of schools interested in buying local foods could also be included so farmers are aware of potential markets for their products.

Additional resources are available that can be helpful to connect school food services directors and local farmers. For example, Food Hubs is one alternative that has recently gained popularity among people who want to purchase local products. Food Hubs aggregates local produce from small and medium size farmers, prepares it, and sometimes process regional foods to meet the requirements of institutional buyers such as schools. Grow Food Carolina is an example of a Food Hub in SC.

In addition, the University of Illinois Extension, the Initiative for the Development of Entrepreneurs in Agriculture, the Illinois Department of Agriculture, and the Illinois Council on Food and Agriculture Research created a tool called MarketMaker. This is a comprehensive, interactive database that connects food producers to new and economically viable markets, and promotes the development of quality driven food supply chains. Promoting this tool to school food services directors can be helpful to source local foods in SC Schools.
VII. LIMITATIONS

Even though the response rate was acceptable for this study, not all school food services directors and managers that participated in the 2011-2012 SC Farm to School Program completed the surveys. It is possible that non-respondents have different opportunities and challenges than those who participated fully.

In the current study, school food services directors and managers expressed their opinions for the 2011-2012 SC Farm to School Program. Thus, findings may not accurately reflect the opinions of additional school food services employees that participate in the program in the future or other food services staff from other states that participate in the Farm to School Program (Derwingson, 2008).
VIII. IMPLICATIONS FOR THE PRACTICE

• Study findings suggest that the Palmetto Pick of the Month is useful to implement the Farm to School Program successfully.

• Regional coordinators play a crucial role in helping schools overcome barriers and sustain the program.

• Program administrators need to provide school food services staff with resources and ideas to promote SC-grown fruits and vegetables, recipes that incorporate SC-grown produce and innovative fruit and vegetable preparation techniques.

• More efforts are needed to connect local farmers and distributors with school food services staff.
IX. CONCLUSIONS

Food services staff and the school food environment play a critical role in the success of the Farm to School program. This study helped understand the opportunities and barriers that school food services staff experienced with the 2011-2012 SC Farm to School Program. Knowledge of perceptions of the school food services employees after one year of implementation and recommendations provided to overcome the most relevant challenges support the efforts to increase sustainability of the SC Farm to School Program. Further research to associate the perceptions of the school food services staff with the level of implementation need to be made to understand program barriers and opportunities in the school cafeteria fully. In addition, research that evaluates changes in children’s eating habits and impacts on obesity and overweight rates will help understand its potential as a school-based nutrition program.
X. RECOMMENDATIONS

The following offers recommendations, based on the literature and the results obtained in this study, for future implementation of the SC Farm to School Program:

• Provide at least one training opportunity to refresh knowledge and improve skills in preparing fresh fruits and vegetables.

• Promote tools such as the “Produce Availability Calendar of SC Grown Produce” and the Palmetto Pick of the Month to help directors plan menus according to produce availability.

• Provide an updated directory that includes GAP certified farmers, their contact information, and the produce they sell, which could be useful to connect school food services directors with farmers.

• Increase coordination and communication between implementers of the Farm to School Program at the school level to increase program sustainability.

• Include cooking demonstrations as a strategy in which school food services staff collaborates with classroom learning.

• Develop strategies to improve competitive foods in the school setting such as the mobile fruit vendor “el frutero” as part of the Farm to School program.

• Promote fresh fruits and vegetables and involve students in marketing activities, which could be useful to increase awareness among students and improve the school food environment.
XI. FURTHER RESEARCH

Future researchers interested in studying the SC Farm to School Program may consider the following objectives:

• Associate the perceptions of the school food services staff with the level of implementation of the program.

• Evaluate changes in children’s eating habits as a result of the SC Farm to School program.
XII. TABLES

Table 1
Federal per Meal Reimbursement Rates for School Meals in the Contiguous States, July 2011 through June 2012.

<table>
<thead>
<tr>
<th>Program</th>
<th>Non-Severe Need</th>
<th>Severe Need</th>
<th>Maximum rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>School breakfast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>$0.27</td>
<td>$0.27</td>
<td></td>
</tr>
<tr>
<td>Reduced Price</td>
<td>$1.21</td>
<td>$1.50</td>
<td></td>
</tr>
<tr>
<td>Paid</td>
<td>$1.51</td>
<td>$1.80</td>
<td></td>
</tr>
<tr>
<td>School lunch</td>
<td>&lt;60% Were Free</td>
<td>≥60% Were Free or Reduced Price</td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>$0.26</td>
<td>$0.28</td>
<td>$0.34</td>
</tr>
<tr>
<td>Reduced Price</td>
<td>$2.37</td>
<td>$2.39</td>
<td>$2.54</td>
</tr>
<tr>
<td>Paid</td>
<td>$2.77</td>
<td>$2.79</td>
<td>$2.94</td>
</tr>
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</table>


Table 2
Percentage of Schools participating in the 2011-2012 South Carolina Farm to School program that have Restrictions for Vending Machines, Competitive Foods and Foods in Fundraiser Activities

<table>
<thead>
<tr>
<th>Regulations for…</th>
<th>No of observations</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The food served in vending machines</td>
<td>20</td>
<td>70</td>
<td>30</td>
<td>0.0736</td>
</tr>
<tr>
<td>Competitive foods sold in the school cafeteria</td>
<td>22</td>
<td>77.3</td>
<td>22.7</td>
<td>0.0105*</td>
</tr>
<tr>
<td>Specifics of the foods allowed in fundraisers or class parties</td>
<td>23</td>
<td>78.2</td>
<td>21.8</td>
<td>0.0067*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: \( p_1 = .5, p_2 = .5 \) with a Pearson Chi-Square test. *p-value < α=0.05
Table 3  
**Perceived Level of Familiarity of the Activities Being Implemented in the Schools Participating in the 2011-2012 South Carolina Farm to School Program by the School Food Service Managers**

<table>
<thead>
<tr>
<th></th>
<th>Very Familiar</th>
<th>Familiar</th>
<th>Somewhat Familiar</th>
<th>Not familiar</th>
<th>Not Sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>34.6%</td>
<td>46.2%</td>
<td>19.2%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.2410</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of $H_0: p_1=.33, p_2=.33, p_3=.33$ with a Pearson Chi-Square test.
*p-value < $\alpha=0.05$

Table 4  
**Perceived Level of Awareness of the Activities Being Implemented in the Schools Participating in the 2011-2012 South Carolina Farm to School Program by the School Food Service Staff According to the School Food Service Managers**

<table>
<thead>
<tr>
<th></th>
<th>Very Aware</th>
<th>Aware</th>
<th>Somewhat Aware</th>
<th>Not Aware</th>
<th>Not Sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Service Staff</td>
<td>25.0%</td>
<td>35.7%</td>
<td>32.1%</td>
<td>7.2%</td>
<td>0.0%</td>
<td>0.1430</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of $H_0: p_1=.25, p_2=.25, p_3=.25, p_4=.25$ with a Pearson Chi-Square test.
*p-value < $\alpha=0.05$

Table 5  
**Perceived Level of Support for the 2011-2012 South Carolina Farm to School Program by the School Food Service Staff According to School Food Service Managers**

<table>
<thead>
<tr>
<th></th>
<th>Very Supportive</th>
<th>Supportive</th>
<th>Somewhat supportive</th>
<th>Not supportive</th>
<th>Not Sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Service Staff</td>
<td>63.3%</td>
<td>33.3%</td>
<td>3.3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of $H_0: p_1=.33, p_2=.33, p_3=.33$ with a Pearson Chi-Square test.
*p-value < $\alpha=0.05$
Table 6  
Perceived Level of Knowledge Concerning Fruits and Vegetables Grown in South Carolina by the School Food Service Directors participating in the 2011-2012 Farm to School Program

<table>
<thead>
<tr>
<th>Directors</th>
<th>Very Knowledgeable</th>
<th>Knowledgeable</th>
<th>Somewhat Knowledgeable</th>
<th>Not knowledgeable</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.0%</td>
<td>63.2%</td>
<td>15.8%</td>
<td>0.0%</td>
<td>0.0214*</td>
<td></td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.33$, $p_2=.33$, $p_3=.33$ with a Pearson Chi-Square test.  
*p-value < $\alpha=0.05$

Table 7  
Palmetto Pick of the Month Fruits and Vegetables Grown in South Carolina According to the Food Service Directors Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Produce</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collards (January)</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Cabbage (March)</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Strawberry (May)</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Peaches (August)</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Watermelon (July)</td>
<td>94.7</td>
<td>5.3</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Tomato (September)</td>
<td>94.7</td>
<td>5.3</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Apples (October)</td>
<td>94.7</td>
<td>5.3</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Turnips (November)</td>
<td>94.7</td>
<td>5.3</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Sumer Squash (April)</td>
<td>89.5</td>
<td>10.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Corn (June)</td>
<td>78.9</td>
<td>21.1</td>
<td>0.0116*</td>
</tr>
<tr>
<td>Parsley (December)</td>
<td>78.9</td>
<td>21.1</td>
<td>0.0116*</td>
</tr>
<tr>
<td>Winter Squash (February)</td>
<td>68.4</td>
<td>31.6</td>
<td>0.1083</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.5$, $p_2=.5$ with a Pearson Chi-Square test.  
*p-value < $\alpha=0.05$
Table 8  
Fruits and Vegetables grown in South Carolina according to the Food Service Directors Participating in the 2011-2012 South Carolina Farm to School Program  

<table>
<thead>
<tr>
<th>Produce</th>
<th>Yes %</th>
<th>No%</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okra**</td>
<td>89.5</td>
<td>10.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Zucchini**</td>
<td>89.5</td>
<td>10.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Cucumber**</td>
<td>89.5</td>
<td>10.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Blueberry**</td>
<td>84.2</td>
<td>15.8</td>
<td>0.0029*</td>
</tr>
<tr>
<td>Cantaloupe**</td>
<td>84.2</td>
<td>15.8</td>
<td>0.0029*</td>
</tr>
<tr>
<td>Broccoli**</td>
<td>78.9</td>
<td>21.1</td>
<td>0.0116*</td>
</tr>
<tr>
<td>Blackberry**</td>
<td>78.9</td>
<td>21.1</td>
<td>0.0116*</td>
</tr>
<tr>
<td>Yam</td>
<td>78.9</td>
<td>21.1</td>
<td>0.0116*</td>
</tr>
<tr>
<td>Kiwi**</td>
<td>31.6</td>
<td>68.4</td>
<td>0.1083</td>
</tr>
<tr>
<td>Celery **</td>
<td>21.0</td>
<td>79.0</td>
<td>0.0116*</td>
</tr>
<tr>
<td>Lemon</td>
<td>10.5</td>
<td>89.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Watercrest</td>
<td>10.5</td>
<td>89.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Pomegranate</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Tangerines</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Apricot</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Banana</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Grapefruit</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Pineapple</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of $H_0: p_1=.5, p_2=.5$ with a Pearson Chi-Square test.  
*p-value < $\alpha=0.05$  
** SC grown fruits and vegetables
Table 9
Extent to Which School Food Service Managers participating in the 2011-2012 SC Farm to School Program Perceive they have Enough Staff to Handle and Increase use of Fresh Fruits and Vegetables

<table>
<thead>
<tr>
<th>Staff</th>
<th>N° Obs</th>
<th>Large extent</th>
<th>Moderate extent</th>
<th>Small extent</th>
<th>Not sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>To handle unprocessed fruits and vegetables¹</td>
<td>29</td>
<td>10.3%</td>
<td>62.1%</td>
<td>27.6%</td>
<td>0.0%</td>
<td>0.0024*</td>
</tr>
<tr>
<td>To handle processed fruits and vegetables²</td>
<td>28</td>
<td>28.5%</td>
<td>53.5%</td>
<td>14.3%</td>
<td>35.7%</td>
<td>0.0013*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: p₁=.33, p₂=.33, p₃=.33 with a Pearson Chi-Square test¹.
P-value for testing the null hypothesis of Ho: p₁=.25, p₂=.25, p₃=.25, p₄=.25 with a Pearson Chi-Square test².
*p-value < α=0.05

Table 10
Extent to Which School Food Service Managers participating in the 2011-2012 Farm to School Program Perceive Time as Barrier for Storing, Preparing and Serving Fresh Fruits and Vegetables in School Meals.

<table>
<thead>
<tr>
<th>N° obs</th>
<th>Large Extent</th>
<th>Moderate Extent</th>
<th>Small extent</th>
<th>Time is not a barrier</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storing</td>
<td>30</td>
<td>6.7%</td>
<td>33.3%</td>
<td>40.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Preparing</td>
<td>28</td>
<td>14.3%</td>
<td>42.8%</td>
<td>28.6%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Serving</td>
<td>28</td>
<td>14.3%</td>
<td>28.6%</td>
<td>35.7%</td>
<td>21.4%</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: p₁=.25, p₂=.25, p₃=.25, p₄=.25 with a Pearson Chi-Square test².
*p-value < α=0.05
Table 11
Perceived School Food Service Staff Skills and Abilities According to the School Food Service Managers of the Schools Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Skill</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Not Sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability to receive fresh fruits and vegetables²</td>
<td>70.0%</td>
<td>26.7%</td>
<td>3.3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Ability to store fresh fruits and vegetables²</td>
<td>70.0%</td>
<td>26.7%</td>
<td>3.3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Safe fruits and vegetables produce handling practices¹</td>
<td>80.0%</td>
<td>20.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0010*</td>
</tr>
<tr>
<td>Knife skills²</td>
<td>46.7%</td>
<td>50.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>3.3%</td>
<td>0.0022*</td>
</tr>
<tr>
<td>Cooking/culinary skills³</td>
<td>40.0%</td>
<td>53.3%</td>
<td>3.3%</td>
<td>0.0%</td>
<td>3.3%</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: p₁=.5, p₂=.5 with a Pearson Chi-Square test¹.
P-value for testing the null hypothesis of Ho: p₁=.33, p₂=.33, p₃=.33 with a Pearson Chi-Square test².
P-value for testing the null hypothesis of Ho: p₁=.25, p₂=.25, p₃=.25, p₄=.25 with a Pearson Chi-Square test³.
*p-value < α=0.05

Table 12
Extent to Which School Food Service Managers participating in the 2011-2012 South Carolina Farm to School Program Perceive They Have Enough Cold Storage, Dry Storage, and Preparation Space

<table>
<thead>
<tr>
<th>Space</th>
<th>Large Extent</th>
<th>Moderate extent</th>
<th>Small Extent</th>
<th>Not Sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold storage¹</td>
<td>46.7%</td>
<td>40.0%</td>
<td>13.3%</td>
<td>0.0%</td>
<td>0.0608</td>
</tr>
<tr>
<td>Dry storage¹</td>
<td>50.0%</td>
<td>33.3%</td>
<td>16.7%</td>
<td>0.0%</td>
<td>0.0821</td>
</tr>
<tr>
<td>Preparation space for unprocessed fruits and vegetables¹</td>
<td>36.7%</td>
<td>53.3%</td>
<td>10.0%</td>
<td>0.0%</td>
<td>0.0136*</td>
</tr>
<tr>
<td>Preparation space for partially processed fruits and vegetables²</td>
<td>36.7%</td>
<td>53.3%</td>
<td>3.3%</td>
<td>6.7%</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: p₁=.5, p₂=.5 with a Pearson Chi-Square test.
P-value for testing the null hypothesis of Ho: p₁=.33, p₂=.33, p₃=.33 with a Pearson Chi-Square test¹.
P-value for testing the null hypothesis of Ho: p₁=.25, p₂=.25, p₃=.25, p₄=.25 with a Pearson Chi-Square test².
*p-value < α=0.05
Table 13
Perceived Availability of Utensils and Equipment Required for Preparing Fresh Fruits and Vegetables According to the School Food Service Managers 2011-2012 Participating in the South Carolina Farm to School Program

<table>
<thead>
<tr>
<th></th>
<th>Yes %</th>
<th>No %</th>
<th>Nor sure %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utensils</td>
<td>96.7</td>
<td>3.3</td>
<td>0.0</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Equipment</td>
<td>93.1</td>
<td>6.1</td>
<td>0.0</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=0.5$, $p_2=0.5$ with a Pearson Chi-Square test. *p-value < $\alpha=0.05$

Table 14
Ways School Food Service Managers Promote South Carolina Grown Fruits and Vegetables Served in the Cafeterias of the Schools Participating in the 2011-2012 South Carolina Farm to School Program.

<table>
<thead>
<tr>
<th>Ways to promote SC grown fruits and vegetables</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posters</td>
<td>86.7</td>
<td>13.3</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Hold fruit/vegetable tastings</td>
<td>70.0</td>
<td>30.0</td>
<td>0.0285*</td>
</tr>
<tr>
<td>Materials with nutrition information for products served in the cafeteria</td>
<td>66.7</td>
<td>33.3</td>
<td>0.0679</td>
</tr>
<tr>
<td>Cafeteria bulletin boards</td>
<td>63.3</td>
<td>36.7</td>
<td>0.1441</td>
</tr>
<tr>
<td>Table tents or flyers for use on the serving line or cafeteria tables</td>
<td>30.0</td>
<td>70</td>
<td>0.0285*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=0.5$, $p_2=0.5$ with a Pearson Chi-Square test. *p-value < $\alpha=0.05$
Table 15
Frequency of School Staff Support to Healthy Eating by being a Role Model to the Children in the School Cafeteria of the Schools Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Staff</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>Not Sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food service¹</td>
<td>83.3%</td>
<td>13.3%</td>
<td>0.0%</td>
<td>3.3%</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Teachers¹</td>
<td>56.7%</td>
<td>40.0%</td>
<td>0.0%</td>
<td>3.3%</td>
<td>0.0012*</td>
</tr>
<tr>
<td>Administrative²</td>
<td>50.0%</td>
<td>43.3%</td>
<td>3.3%</td>
<td>3.3%</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: p₁=.33, p₂=.33, p₃=.33 with a Pearson Chi-Square test¹.
P-value for testing the null hypothesis of Ho: p₁=.25, p₂=.25, p₃=.25, p₄=.25 with a Pearson Chi-Square test².
*p-value < α=0.05

Table 16
Frequency of Activities in Which Food Service Staff Collaborates with Teachers to Help with Classroom Learning Pertaining Local Foods According to the School Food Service Managers Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Activities</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Twice a Year</th>
<th>Once a Year</th>
<th>Never</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking demonstrations</td>
<td>4.5%</td>
<td>13.6%</td>
<td>18.1%</td>
<td>13.6%</td>
<td>50.0%</td>
<td>0.0093*</td>
</tr>
<tr>
<td>Taste Tastings</td>
<td>4.0%</td>
<td>40.0%</td>
<td>40.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>0.0021*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: p₁=.20, p₂=.20, p₃=.20, p₄=.20, p₅=.20 with a Pearson Chi-Square test.
*p-value < α=0.05
### Table 17
Technical Assistance Provided by the Regional Coordinators According to Food Service Directors and Managers Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Type of Technical Assistance</th>
<th>Directors (n=19)</th>
<th></th>
<th></th>
<th>Manag (n=28)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes %</td>
<td>No %</td>
<td>p-value</td>
<td>Yes %</td>
<td>No %</td>
<td>p-value</td>
</tr>
<tr>
<td>Sourcing South Carolina grown products distributors</td>
<td>68.4</td>
<td>31.6</td>
<td>0.1083</td>
<td>75.0</td>
<td>25.0</td>
<td>0.0082*</td>
</tr>
<tr>
<td>Sourcing South Carolina grown produce from a GAP certified farmer</td>
<td>68.4</td>
<td>31.6</td>
<td>0.1083</td>
<td>78.6</td>
<td>21.4</td>
<td>0.0025*</td>
</tr>
<tr>
<td>Addressing storage concerns for SC grown fruits and vegetables</td>
<td>15.8</td>
<td>84.2</td>
<td>0.0029*</td>
<td>32.1</td>
<td>67.9</td>
<td>0.0588</td>
</tr>
<tr>
<td>Providing resources and ideas to promote SC grown produce in the your cafeterias</td>
<td>89.5</td>
<td>10.5</td>
<td>0.0006*</td>
<td>78.6</td>
<td>21.4</td>
<td>0.0025*</td>
</tr>
<tr>
<td>Providing recipes and preparation techniques that use South Carolina produce</td>
<td>100</td>
<td>0</td>
<td>0.0001*</td>
<td>78.6</td>
<td>21.4</td>
<td>0.0025*</td>
</tr>
<tr>
<td>Providing training program(s) for School Food Service teams concerning Farm to School and program components</td>
<td>63.2</td>
<td>36.8</td>
<td>0.2513</td>
<td>42.9</td>
<td>57.1</td>
<td>0.4497</td>
</tr>
<tr>
<td>I did not received any technical assistance from the Farm to School regional coordinators</td>
<td>0.0</td>
<td>100</td>
<td>0.001*</td>
<td>0.0</td>
<td>100</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Other</td>
<td>10.5</td>
<td>89.5</td>
<td>0.0006*</td>
<td>0.0</td>
<td>100</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.5, p_2=.5$ with a Pearson Chi-Square test. *p-value < $\alpha=0.05$
### Table 18
Usefulness of the Technical Assistance Provided by the Regional Coordinators According to Food Service Directors and Managers Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Population</th>
<th>Very Useful</th>
<th>Useful</th>
<th>Somewhat Useful</th>
<th>Not Useful</th>
<th>Not Sure</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>School food service directors</td>
<td>42.1</td>
<td>31.6</td>
<td>15.8</td>
<td>0.0</td>
<td>10.5</td>
<td>0.0297*</td>
</tr>
<tr>
<td>School food service managers</td>
<td>64.3</td>
<td>25.0</td>
<td>10.7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.33$, $p_2=.33$, $p_3=.33$ with a Pearson Chi-Square test$^1$.
P-value for testing the null hypothesis of Ho: $p_1=.25$, $p_2=.25$, $p_3=.25$, $p_4=.25$ with a Pearson Chi-Square test$^2$.
*p-value < $\alpha=0.05$

### Table 19
Motivators for Purchasing and serving South Carolina Grown Fruits and Vegetables in the School Cafeteria According to Food Service Directors Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Motivators</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to fresher fruits and vegetables</td>
<td>94.7</td>
<td>5.3</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Higher-quality food</td>
<td>73.7</td>
<td>26.3</td>
<td>0.0389*</td>
</tr>
<tr>
<td>Higher consumption of fruits and vegetables by students</td>
<td>63.1</td>
<td>36.9</td>
<td>0.2513</td>
</tr>
<tr>
<td>Ability to purchase small quantities</td>
<td>52.6</td>
<td>47.4</td>
<td>0.8185</td>
</tr>
<tr>
<td>Lower costs of transportation</td>
<td>42.1</td>
<td>57.9</td>
<td>0.4913</td>
</tr>
<tr>
<td>Ability to purchase special varieties or types of produce</td>
<td>36.8</td>
<td>63.2</td>
<td>0.2513</td>
</tr>
<tr>
<td>I do not have any motivators</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Other</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.5$, $p_2=.5$ with a Pearson Chi-Square test.
*p-value < $\alpha=0.05$
Table 20
Motivators for serving South Carolina Grown Fruits and Vegetables in the School Cafeteria According to Food Service Managers Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Motivators</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students eat better at school</td>
<td>83.3</td>
<td>16.7</td>
<td>0.0003*</td>
</tr>
<tr>
<td>Obesity or overweight rates in children may be reduced</td>
<td>80.0</td>
<td>20.0</td>
<td>0.0010*</td>
</tr>
<tr>
<td>Students enjoy tastier meals when they serve SC grown produce</td>
<td>53.3</td>
<td>46.7</td>
<td>0.7150</td>
</tr>
<tr>
<td>I do not have any motivators to implement SC Farm to School Program</td>
<td>10.0</td>
<td>90.0</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Other</td>
<td>6.7</td>
<td>93.3</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.5, p_2=.5$ with a Pearson Chi-Square test. *p-value < $\alpha=0.05$

Table 21
Concerns with Purchasing and Serving South Carolina Grown Fruits and Vegetables for the School Cafeteria According to Food Service Directors Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Concerns</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate availability due to seasonality</td>
<td>68.4</td>
<td>31.6</td>
<td>0.1083</td>
</tr>
<tr>
<td>High cost</td>
<td>47.4</td>
<td>52.6</td>
<td>0.8185</td>
</tr>
<tr>
<td>Food safety and handling practices of the produce</td>
<td>47.4</td>
<td>52.6</td>
<td>0.8185</td>
</tr>
<tr>
<td>Reliability of the produce</td>
<td>36.8</td>
<td>63.2</td>
<td>0.2513</td>
</tr>
<tr>
<td>Quality and consistency of the product</td>
<td>36.8</td>
<td>63.2</td>
<td>0.2513</td>
</tr>
<tr>
<td>I do not have any concerns</td>
<td>15.7</td>
<td>84.3</td>
<td>0.0029*</td>
</tr>
<tr>
<td>Other</td>
<td>10.5</td>
<td>89.5</td>
<td>0.0006</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.5, p_2=.5$ with a Pearson Chi-Square test. *p-value < $\alpha=0.05$
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of products available during certain time of the year</td>
<td>84.2</td>
<td>15.8</td>
<td>0.0029*</td>
</tr>
<tr>
<td>Finding farmers to purchase from directly</td>
<td>73.7</td>
<td>26.3</td>
<td>0.0389*</td>
</tr>
<tr>
<td>Delivery issues</td>
<td>57.9</td>
<td>42.8</td>
<td>0.4913</td>
</tr>
<tr>
<td>Budget constraints</td>
<td>36.8</td>
<td>63.2</td>
<td>0.2513</td>
</tr>
<tr>
<td>Contracted distributor does not offer the local products we want</td>
<td>36.8</td>
<td>63.2</td>
<td>0.2513</td>
</tr>
<tr>
<td>Policies in the food service contract that prevents or limits purchasing of South Carolina grown fruits and vegetables</td>
<td>26.3</td>
<td>73.7</td>
<td>0.0389*</td>
</tr>
<tr>
<td>Purchasing the local foods might threaten the relationship with my usual vendor</td>
<td>21.1</td>
<td>78.9</td>
<td>0.0116*</td>
</tr>
<tr>
<td>Multiple orders and invoices</td>
<td>10.5</td>
<td>89.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>I do not have any barriers</td>
<td>10.5</td>
<td>89.5</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Other</td>
<td>5.3</td>
<td>94.7</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of Ho: $p_1=.5, p_2=.5$ with a Pearson Chi-Square test.

*p-value < $\alpha=0.05$
Table 23
Barriers to Incorporate South Carolina Grown Fruits and Vegetables in School Cafeteria According to Food Service Managers Participating in the 2011-2012 South Carolina Farm to School Program

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Yes %</th>
<th>No %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I do not have any barriers to implement the South Carolina Farm to School Program</td>
<td>75.0</td>
<td>25.0</td>
<td>0.0082*</td>
</tr>
<tr>
<td>Extra labor and preparation time</td>
<td>17.9</td>
<td>82.1</td>
<td>0.0007*</td>
</tr>
<tr>
<td>The staff does not have the skills</td>
<td>3.6</td>
<td>96.4</td>
<td>0.0001*</td>
</tr>
<tr>
<td>The facilities do not allow the preparation of fresh fruits and vegetables</td>
<td>3.6</td>
<td>96.4</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Not enough storage space</td>
<td>3.6</td>
<td>96.4</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Other</td>
<td>3.6</td>
<td>96.4</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Don’t have the equipment or utensils</td>
<td>0.0</td>
<td>100.0</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Students do not like the South Carolina grown fruits and vegetables</td>
<td>0.0</td>
<td>100.0</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

P-value for testing the null hypothesis of $H_0: p_1=.5, p_2=.5$ with a Pearson Chi-Square test. *p-value < $\alpha=0.05$
XIII. APPENDICES
APPENDIX A

Invitation Letter

Dear Sir/Madam,

My name is Maciel Ugalde. I am a graduate student in the Department of Food, Nutrition and Packaging Sciences of Clemson University. I am conducting a research study as the last of the requirements for my Master’s degree, and I would like to invite you to participate on it.

For the study I will be assessing the factors associated with a high level of implementation of the South Carolina Farm to School program in the food service area. Collecting this information will help the South Carolina Farm to School Program to assess the effectiveness and barriers of the program; this will allow us to share the successes and challenges with other schools to make improvements to the program.

If you decide to participate, please complete the survey that was sent to you. On the envelope it was sent, you will find another envelope with the appropriate address and stamps to send it back to me you just need to put it on the mail. The survey is about the process of purchasing, storing, preparing, and serving South Carolina grown fruits and vegetables in the school cafeteria. This survey will only take you 10 to 15 minutes to complete.

After completing the survey, you will receive a 5 dollar gift card from Walmart. The first twenty persons to complete will receive a $10 gift card from Walmart instead of a $5 gift card.

If you have any questions or concerns about this study or if any problems arise, please contact Dr. Katherine Cason at 864-723-4520 or email her at KCASON@clemson.edu. You can also email Maciel Ugalde to mugalde@g.clemson.edu. Thank you for your collaboration.

Best regards,

Maciel Ugalde
Graduate Teaching Assistant
Department Food Science and Human Nutrition
E255 Poole Agricultural Center
Clemson University
APPENDIX B

PALMETTO PICK OF THE MONTH

August  Peaches
September  Tomatoes
October  Apples
November  Turnips
December  Parsley

January  Collards
February  Winter Squash
March  Cabbage
April  Summer Squash
May  Strawberries

June  Corn
July  Watermelon
APPENDIX C

Food Service Directors Assessment

Thank you for taking the time to complete this survey. Your opinion on the implementation of the South Carolina Farm to School Program is important.

Instructions: Please answer the following questions concerning your school district.

1. Please provide the name of the school district:
   ____________________________________________________________

2. Please name the school(s) in your district that participate in the South Carolina Farm to School Program:
   1. ________________________________________________________
   2. ________________________________________________________
   3. ________________________________________________________

3. How is your food service managed?
   O Self-managed (If selected, go to question 5)
   O Contract managed

4. Who is your management company? ____________________________

5. Do you have a central kitchen that delivers meals to other schools?
   O Yes
   O No

6. How would you describe your level of knowledge concerning fruits and vegetables grown in South Carolina?
   O Very knowledgeable
   O Knowledgeable
   O Somewhat knowledgeable
   O Not knowledgeable
7. Did the Farm to School regional coordinators provide you with any of the following technical assistance? (Mark all that apply)
   O Sourcing South Carolina grown produce from distributors
   O Sourcing South Carolina grown produce from a local GAP (Good Agricultural Practices) certified farmer.
   O Addressing storage concerns for SC grown fruits and vegetables
   O Providing resources and ideas to promote South Carolina grown produce in your cafeterias
   O Providing recipes and preparation techniques that use South Carolina grown produce
   O Providing training program(s) for School Food Service teams concerning Farm to School and program components
   O I did not receive any assistance from the Farm to School Regional Coordinators. (If selected, go to question 9)
   O Other:_______________________________________________

8. How useful was the assistance of the regional coordinators in identifying sources for purchasing South Carolina grown fruits and vegetables?
   O Very useful
   O Useful
   O Somewhat useful
   O Not useful
   O Not sure
9. Which of the following fruits and vegetables are grown in South Carolina? (Mark all that apply)

O Celery
O Broccoli
O Peach
O Lemon
O Tomato
O Strawberry
O Tangerines
O Watermelon
O Okra
O Corn
O Cabbage
O Kiwi
O Zucchini
O Blackberry
O Turnip
O Parsley
O Apricot
O Banana
O Grapefruit
O Summer Squash
O Pineapple
O Blueberry
O Cantaloupe
O Apple
O Yam
O Watercrest
O Collards
O Cucumber
O Winter Squash
O Pomegranate
10. Which of the following are motivators for purchasing and serving South Carolina grown fruits and vegetables? (Mark all that apply).
O Access to fresher fruits and vegetables
O Higher consumption of fruits and vegetables by students
O Lower costs of transportation
O Higher-quality food
O Ability to purchase small quantities
O Ability to purchase special varieties or types of produce
O I do not have any motivators to implement the South Carolina Farm to School Program
O Other: ____________________________________________

12. Which of the following are concerns with purchasing and serving South Carolina grown fruits and vegetables? (Mark all that apply).
O High cost
O Food safety and handling practices of the produce
O Reliability of the produce
O Inadequate availability due to seasonality
O Quality and consistency of the product
O I do not have any concerns to implement the South Carolina Farm to School Program
O Other: ____________________________________________

13. In your opinion, what are the barriers for incorporating South Carolina grown fruits and vegetables in the school cafeteria in your district? (Mark all that apply).
O Finding farmers to purchase from directly
O Multiple orders and invoices
O Delivery issues
O Lack of products available during certain times of the year
O Budget constraints
O Contracted distributor does not offer the local products we want
O Purchasing local foods might threaten the relationship with my usual vendor
O Policies in the food service contract that prevents or limits purchasing of South Carolina grown fruits and vegetables
O I do not have any barriers to implement the South Carolina Farm to School Program
O Other: ____________________________________________

Thank you!
APPENDIX D

Food Service Managers Assessment

Thank you for taking the time to complete this survey. Your opinion on the implementation of the South Carolina Farm to School Program is important.

Instructions: Please answer the following questions concerning the school in which you work.

1. Please provide the name of the school: _____________________________________________

2. Does your school have any restrictions for...? If yes, please describe in the space provided.

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
<th>Please specify</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food served in vending machines</td>
<td>O</td>
<td>O</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>Competitive foods sold in the school cafeteria</td>
<td>O</td>
<td>O</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>Specifics of the foods allowed in fundraisers (student's clubs/sports, PTA, trips) or class parties.</td>
<td>O</td>
<td>O</td>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>
3. Is your school participating in programs (other than the Farm to School program) to increase students’ fruit and vegetable consumption?
   O Yes
   O No (If selected, go to question 5)

4. In which of the following programs is your school participating?
   O Department of Defense Fresh Program
   O The USDA Fruit and Vegetable Program
   O Other:___________________________

5. Are activities being implemented in your school as part of the South Carolina Farm to School Program?
   O Yes
   O No (If selected, go to question 8)
   O Not sure

6. How familiar are you with the South Carolina Farm to School Program activities being implemented at your school?
   O Very familiar
   O Familiar
   O Somewhat familiar
   O Not familiar
   O Not sure

7. In your opinion, how aware do you believe your food service staff is of the South Carolina Farm to School Program activities being implemented at your school?
   O Very aware
   O Aware
   O Somewhat aware
   O Not aware
   O Not Sure

8. In your opinion, how supportive is the food service staff at your school of the South Carolina Farm to School program?
   O Very supportive
   O Supportive
   O Somewhat supportive
   O Not supportive
   O Not Sure
9. Does your school have a "cook from scratch" kitchen?
O Yes
O No
O Don't know

10. Do you have a salad bar (not including pre-made salads) in your school?
O Yes
O No

11. Are "pre-made" salads offered on the school menu?
O Yes
O No

12. To what extent do you believe your current food service have enough staff to handle an increase use of fresh fruits and vegetables?

<table>
<thead>
<tr>
<th></th>
<th>Large extent</th>
<th>Moderate extent</th>
<th>Small extent</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unprocessed South Carolina grown fruits and vegetables (e.g. whole apples)</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Partially processed South Carolina grown fruits and vegetables (e.g. pre-packaged apple slices)</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

13. To what extent do you believe you have enough cold storage to accommodate fresh fruits and vegetables?

<table>
<thead>
<tr>
<th></th>
<th>Large extent</th>
<th>Moderate extent</th>
<th>Small extent</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold Storage</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
14. To what extent do you believe you have enough dry storage to accommodate fresh fruits and vegetables?

<table>
<thead>
<tr>
<th></th>
<th>Large extent</th>
<th>Moderate extent</th>
<th>Small extent</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Storage</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

15. To what extent do you believe you have enough preparation space to prepare fresh fruits and vegetables?

<table>
<thead>
<tr>
<th></th>
<th>Large extent</th>
<th>Moderate extent</th>
<th>Small extent</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unprocessed South Carolina grown</strong></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
| **fruits and vegetables** (e.g. whole apples)**
| **Partially processed South Carolina grown fruits and vegetables** (e.g. pre-packaged apple slices)
|                                      | O            | O               | O            | O        |

16. Does your school have the utensils required to prepare fresh fruits and vegetables?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Utensils</strong> (e.g. knives, cutting boards, slicers, etc.)</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

17. Does your school have the equipment (other than utensils) required to prepare fresh fruits and vegetables?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment</strong> (e.g. sinks, industrial food processors, ovens, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
18. How would you describe your staff’s skills on...

<table>
<thead>
<tr>
<th>Capability to receive fresh fruits and vegetables</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ability to store fresh fruits and vegetables</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safe fruit and vegetable produce handling practices</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Knife skills</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooking/culinary skills</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

19. In the past two years, has your staff participated in any training program(s) to store, prepare or serve whole fresh fruits and vegetables?
O Yes
O No (If selected, go to question 20)

20. List the training program(s) that your staff has participated in to store, prepare or serve fresh fruits and vegetables.
1. _______________________________________________
2. _______________________________________________
3. _______________________________________________

21. What training program(s) concerning storing, preparing or serving fresh fruits and vegetables do you think would be helpful in implementing the South Carolina Farm to School Program in your school?
1. _______________________________________________
2. _______________________________________________
3. _______________________________________________
22. In which of the following ways do you promote South Carolina grown fruits and vegetables that are served in the school cafeteria to the students?
O Posters
O Cafeteria bulletin board displays
O Materials with nutrition information for products served in the cafeteria
O Table tents or flyers for use on the serving line or cafeteria tables
O Hold fruit/vegetable tastings
O Other: ___________________________________________________ 

23. Has the Palmetto Pick of the Month tool helped you promote South Carolina grown fruits and vegetables in the school cafeteria?
O Yes
O No
O Not sure

24. To what extent is time a barrier for storing, preparing and serving fresh fruits and vegetables in your school meal?

<table>
<thead>
<tr>
<th></th>
<th>Large extent</th>
<th>Moderate extent</th>
<th>Small extent</th>
<th>Time is not a barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storing</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Preparing</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Serving</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

25. Please describe the ways you encourage students to eat South Carolina grown fruits and vegetables?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
26. When South Carolina Grown fruits and vegetables are served at the cafeteria; do the following school’s staff support healthy eating by being role models to the children?

<table>
<thead>
<tr>
<th></th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food service staff</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Teachers</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Administrative staff</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

27. Does the food service staff collaborate with teachers to help with classroom learning concerning South Carolina grown fruits and vegetables?

O Yes
O No (If selected, go to question 29)

28. How often does your food service staff collaborate with teachers to help with classroom learning pertaining to food with the following activities?

<table>
<thead>
<tr>
<th></th>
<th>Weekly</th>
<th>Monthly</th>
<th>Twice a year</th>
<th>Once a year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking demonstrations</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Taste tastings</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Other:__________________</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

29. Did the Farm to School regional coordinators provide you with any of the following technical assistance? (Mark all that apply)

O Sourcing South Carolina grown produce from distributors
O Sourcing South Carolina grown produce from a local GAP (Good Agricultural Practices) certified farmer.
O Addressing storage concerns for SC grown fruits and vegetables
O Providing resources and ideas for promoting South Carolina grown produce in their cafeterias
O Providing recipes and preparation techniques to use South Carolina grown produce
O Providing training program(s) for school food service teams about Farm to School and program components
O I did not receive any assistance from the Farm to School regional coordinators. (If selected, go to question 31)
O Other:_______________________________________________
30. How useful was the assistance provided by the Farm to School regional coordinators?
O Very useful
O Useful
O Somewhat useful
O Not useful
O Not sure

31. Which of the following are motivators to purchase and serve South Carolina grown fruits and vegetables? (Mark all that apply).
O Students eat better at school
O Obesity or overweight rates in children may be reduced
O Students enjoy tastier meals when they purchase SC grown produce
O I do not have any motivators to implement the South Carolina Farm to School Program
O Other: ____________________________

32. In your opinion, what are the barriers for incorporating South Carolina grown fruits and vegetables in the school cafeteria? (Mark all that apply).
O The staff does not have the skills
O Extra labor and preparation time
O Don't have the equipment or utensils
O The facilities do not allow the preparation of fresh fruits and vegetables
O Students do not like the South Carolina grown fruits and vegetables
O Not enough storage space
O I do not have any barriers to implement the South Carolina Farm to School Program
O Other: ____________________________

Thank you!
APPENDIX F

The original goal of the study was to associate the perceptions of the school food service staff with the level of implementation of the 2011-2012 South Carolina Farm to School Program. To accomplish this goal the Farm to School Evaluation Team needed to provide a complete procurement database that included the produce that was purchased in the schools during the year of implementation.

Due to time constraints, the database available to the researcher included information from only the first six months of implementation. In addition, not all the schools were represented in the database. Records such as produce reports, invoices and menus were hard to obtain from the school food service staff so there was some data that was not entered for those schools.

Using the database as it was could result in misinforming about the 2011-2012 South Carolina Farm to School program accomplishments. Using the first six months of implementation with the schools that data was entered low implantation because it takes some time for schools food service staff to incorporate the changes in the cafeteria. A statistician also recommended using only information of the last month included in the database; however, that will also produce bias in the results. Taking into consideration, it was decided to change the type of analysis for this study and wait until the database is complete to associate the results of the survey with the level of implementation. However, this study will be done in the future when the database is complete. The brainstorming process was a learning experience to me since in reality not having
complete databases on time is common and you have to be able to make the best of what you have.
XIV. REFERENCES


Grace, B., Rubinstein, J., Schaum, A., & Vossbrinck, D. (2009). *Anderson County Farm & Food Plan*. Anderson County, South Carolina:


South Carolina Food Policy Council. (2011). *Farm to school and beyond…. (Workshop Final Report).*


