

Expanding Access of Local Farmers to  
Consumers in Charleston, South Carolina

William Want

Academic Magnet High School

### Abstract

The local food movement, which seeks to increase the consumption of locally produced foods, began about two decades ago. It has since quickly gained national attention due in large part to the public's disgust with the current industrialized food system. The researcher traces the history of the current national food system by describing the pre-industrialized food system and its rapid industrialization beginning with World War II. He also examines the adverse impacts of the industrial food system on public health, local economies, and the environment. To augment the local food movement in Charleston, the researcher conducted a study of GrowFood Carolina, South Carolina's first "food hub." A food hub acts as a middleman between farmers and producers to facilitate local food marketing. The study sought to answer the question: how do local farmers access consumers in Charleston, what are their needs as farmers, and how can GrowFood meet these needs? The researcher gathered quantitative data through questionnaires and qualitative data through telephone interviews. The quantitative data showed that the marketing outlets most commonly used by local farmers are wholesale in state, on farm sales, and farmers' markets. The qualitative data revealed various challenges for farmers including lack of cold storage space and insufficient marketing knowledge. Analysis of this data revealed that GrowFood provides services that address many of these problems, but farmers sometimes do not utilize them because they are confused as to GrowFood's operations. The researcher made recommendations for how GrowFood could be clearer about its services.

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## **Expanding Access of Local Farmers to Consumers in Charleston, South Carolina**

### **Rationale**

Beginning in the 1950's, food in the United States has been increasingly imported from outside of the state in which it is consumed. Grocery stores, restaurants, and other food retailers purchase imported food because it is cheaper, coming mostly from large corporations, whose mass production and transportation techniques allow for "enormous efficiencies and conveniences" (Richman, 2011, p. 6). While these techniques make food production a quicker and cheaper process, they have created unintended consequences that arguably outweigh the benefits they provide.

The three most significant consequences of the current United States food system are adverse effects on health, local economies, and the environment. Most food is highly processed and transported great distances before consumption (Pollan, 2010). The consumption of this highly processed food, rather than fresher local food, has been linked to a widespread decrease in health across all socioeconomic groups in the U.S. (Richman, 2011). In particular, poor food quality has contributed to rising levels of obesity in all parts of the country, including South Carolina, where less than 10% of the total food consumed originates in the state ("GrowFood Carolina," 2011). In addition, the vertical integration of food corporations takes profit away from local producers and processors. Vertical integration refers to one company or corporation expanding its business to different points in the production of a product, in this case farming, processing, and distributing. This drains money out of the economies of towns in which small and mid-sized farmers, processors, and distributors are located and leads to significant job losses. In fact, the USDA Economic Research Service reported that "the U.S. lost 600,000 on-farm jobs and 1.3 million agricultural processing and marketing jobs between 1982 and 2002" (Richman,

2011, p. 6). The national food system also has adverse consequences involving the environment. These impacts stem in part from the transportation of foods great distances to local markets, causing enormous energy consumption, which in turn results in significant pollution including the release of greenhouse gases (Pollan, 2010). While awareness of the need for locally grown foods to alleviate the negative effects of the current food system is increasing, most food retailers, including grocery stores and restaurants, show no clear indications of substantially using them (Clow, 2012a). The question that must be answered then is what obstacles are preventing local farmers from marketing their food effectively to retailers?

Realizing that many farmers who market their food locally are struggling in certain areas, the South Carolina Conservation League recently undertook a major effort to increase local food use. In October, 2011, the Conservation League, under its GrowFood Carolina initiative, opened a large warehouse on Morrison Avenue to serve as a distribution facility of local foods to retailers in the Charleston area. GrowFood acts as a middle man between local farmers and retailers, not only through the warehouse, but also by matching buyers with sellers, establishing fair prices, and providing market services (“GrowFood Carolina,” 2011). These services characterize GrowFood as a “food hub,” which is a resource that helps farmers “collaborate on marketing and distribution” (Thompson, 2012, para. 2). By pooling their production and marketing it as a larger product, small and mid-sized producers can fill larger orders and increase their profits.

Food hubs are relatively new phenomena, with the majority of states in the U.S. still not having any. GrowFood’s was the first of two hubs that exist in South Carolina (“GrowFood Carolina,” 2011). The arrival of a food hub presents an exceptional opportunity to expand the consumption of local foods in Charleston. Unfortunately, due to its newness, GrowFood does not

yet have much data on Charleston's current local food infrastructure. An area's "food infrastructure" covers every part of the supply chain that handles the food from when it is produced to when it is ultimately consumed. GrowFood's lack of knowledge about the food infrastructure in Charleston hinders its operations. In particular, there is insufficient data on how the majority of farmers currently access local consumers and how the farmers who work with GrowFood feel about using the food hub. GrowFood also lacks a thorough understanding of the needs of the farmers in and around the Charleston area. If GrowFood had that information, it could work to meet those needs and more effectively incorporate the farmers into the local food infrastructure, thereby expanding the farmers' consumer access and hopefully increasing the consumption of local foods in Charleston.

### **Statement of the Problem**

The governing question of this thesis is: How do farmers in the Charleston area currently access local consumers, what are the barriers to their entry into the local food market, and how could GrowFood Carolina act to help them overcome these barriers? The principal aim of this study is to enhance the functioning of GrowFood by deepening its understanding of the needs of local farmers. Prior studies in other states, such as those conducted by Perrett (2007) and Slama, Nyquist, & Bucknum (2010), suggest that small and mid-sized farmers will be willing to participate in local foods efforts if their needs are assessed and adequately addressed. The newness of GrowFood, which arrived in Charleston in October of 2011, leaves it without adequate information regarding the needs of many local farmers. If this information were collected and given to GrowFood, it would facilitate the group's efforts.

### **Methods**

The researcher gathered data in two phases. In the first phase, the researcher compiled the results of a questionnaire, designed by the general manager of GrowFood, Sara Clow, which had been completed by 29 farmers whose farms are located within 120 miles of Charleston County. The questionnaire contained 15 questions that assessed the quantitative aspects of farming, such as acreage harvested and number of employees. The compiled results were put into a Microsoft Excel spreadsheet. In the second phase of the data collection, the researcher used phone numbers taken from the questionnaire results, as well as some received directly from Ms. Clow, to conduct a survey over the phone with 13 local farmers. The survey included several open-ended questions regarding primarily the challenges they face as small to mid-sized farmers and what they think about the effectiveness of GrowFood. The researcher recorded the qualitative data from each call in a Microsoft Word document. Examination of the quantitative data showed how farmers in the Charleston area currently access consumers. Analysis of the qualitative data revealed the needs of local farmers as well as their opinions of GrowFood. Based on this analysis, the researcher drafted several recommendations for GrowFood regarding how it could more effectively meet the needs of the farmers with whom it works.

### **Research Questions**

The sub-questions that were addressed are: Are farmers in the Charleston area interested in changing the way they sell their food? What are farmers' views of the strengths and weaknesses of the new food hub? In what ways does GrowFood already address the needs of local farmers? Other topics discussed include the history of food production, the adverse impacts of the current food system, and the local foods movement both in the United States and in Charleston specifically.

### **Implications**

The data gathered has several implications for GrowFood. The quantitative data gives GrowFood a better understanding of which food marketing outlets are preferred by local farmers in the Charleston area. The qualitative data reveals what problems the farmers have that GrowFood should try to deal with, and it also shows GrowFood what farmers think are the food hub's strengths and weaknesses. In particular, it demonstrates that there is insufficient communication between GrowFood and its farmers, because even some farmers working with GrowFood reported certain problems that the food hub actually already handled. The recommendations, therefore, focus on helping GrowFood explain more clearly to the farmers how the food hub works and what services, including food market knowledge and cold storage, it provides.

### **Significance**

The compiled quantitative data is meaningful to GrowFood primarily because until now there has been no organized data concerning the food marketing outlets preferred by farmers in the Charleston area. The qualitative data is significant because if GrowFood were to act on the researcher's recommendations, it would allow the entire system to operate more smoothly and with less miscommunication for both GrowFood and the farmers it services.

. For the farmers, fewer instances of miscommunication would allow them to sell more of their crops and make more money. New farmers would be able to more quickly and effectively integrate themselves into the food hub system. This would encourage more farmers to work with GrowFood, which would benefit them greatly. In addition, if the farmers had more comprehensive knowledge of how the food hub system worked, they would feel more

comfortable contributing to it.

While farmers would certainly be benefited, the changes would also be significant for GrowFood. If there were less miscommunication and farmers consequently made more money, GrowFood would become more successful and would command more respect from the farmers. This would lead the farmers to more consistently follow GrowFood's farming advice, which, according to Sara Clow, has been a hindrance occasionally in the past (Clow, 2012b). Also, with farmers more satisfied working with the food hub, GrowFood would expand its loyal base of farmers and would be able to grow more quickly as an organization. The significance of all of this, of course, is that the success of GrowFood would ensure that more local foods are eaten in Charleston, thereby helping to counteract the negative effects of the industrialized agriculture system.

### **Applicability**

The food hub system is somewhat new, and its success depends on its ability to adequately address the needs of small and mid-sized local farmers. Part of the data collected in this thesis revealed what the farmers working with GrowFood like and do not like about the system as well as how well it addresses their needs. This data can be applied to reveal the strengths and possible weaknesses of existing food hubs and help lay the groundwork for even more efficient food hubs in the future.

## **Chapter II: Review of Literature**

The local foods movement is gaining strength across the country, with more and more campaigns urging people to eat locally grown foods and increasing public interest in doing so. This literature review describes how the United States food system evolved from being generally local before World War II to being an industrialized system in which foods are highly processed and travel on average 1,500 miles from their point of production to consumption. It analyzes the adverse impacts of this food system on health, local economies, and the environment and then describes how, in reaction to these impacts, the local foods movement became nationally significant in the last two decades. The review then shifts to the local level by describing how the local foods movement is developing in the Charleston area.

### **History of Food Production**

In 1800, nearly all of the food consumed in the United States was grown by subsistence farmers. Today, most of the food Americans consume comes from huge industrialized feeding and growing operations more than a thousand miles away from the supermarket or restaurant at which it is eventually purchased. While much of the change has occurred in the last 50 to 60 years, the roots of industrialized agriculture can be traced back to the mid nineteenth century.

Some authorities mark the beginning of agricultural industrialization as Cyrus McCormick's invention of the reaper in the 1840's, which allowed farmers to shift from subsistence farming to commercial agriculture (Andrews et al., 2008). Soon other farm machines began to emerge, including the wire binder, the threshing machine, and the combine. A major milestone in the development of industrialized agriculture was the invention of the tractor in 1892 by John Froelich (Oden, 2009). The tractor had a huge impact on American agriculture because, like the reaper, it vastly enhanced farmers' efficiency, allowing them to grow more

crops per acre.

World War II accelerated the trends toward industrialization of agriculture by forcing farmers to utilize new methods for more efficient production (Kolar, 2011). There was a sudden boom in demand for food because the United States was supplying not only its domestic population and its troops overseas, but also to a substantial extent its allies. One of the ways farmers increased production was by using more efficient machinery. Tractors, for example, were redesigned to be much more effective (Ganzel & Reinhardt, n.d.). Not only were they made much smaller and more powerful, but they were also sold more cheaply, which allowed many more farmers to purchase one. Another practice that grew more common during the war was the use of fertilizers (Kolar, 2011). Fertilizers increased crop production immensely by providing crops with high concentrations of nutrients—primarily potassium, phosphorus, and nitrogen—that helped them grow when sufficient nutrients were not naturally present in the soil. Like the redesigned machinery, fertilizers allowed farmers to increase their output with a set amount of land. Also, the insertion of antibiotics and other additives into animal feed as well as genetic breeding emerged as techniques that helped maximize production (Ganzel & Reinhardt, n.d.).

After World War II, these trends only increased. Immediately after the war ended, there was a huge supply of excess chemicals. This was because during the war, ammonium nitrate was used in making bombs, TNT, and other explosives (Ganzel & Reinhardt, n.d.). To keep a steady supply, the government had built ten new chemical plants. With no need for the ammonium nitrate after the war, factories started turning it into fertilizer, which marked the beginning of mass fertilizer use. The other main type of chemicals that became more common in agriculture during and after World War II were pesticides. During the war, DDT was used to kill disease-transmitting insects around troops, especially those carrying malaria. After the war, it became a

commonly used pesticide.

This post-war continuation of agricultural industrialization trends was fueled by a growing concern for feeding the world's poor. The subsequent boom in agricultural research and invention, known as the "Green Revolution," greatly increased farm production by utilizing genetic selection, irrigation, and chemical fertilizers (Andrews et al., 2008). The Green Revolution increased corn yields in particular, boosting the yield from an average of 70 to 80 bushels per acre in 1940 to 200 bushels per acre in 1980.

While the Green Revolution augmented crop production, innovations in farm animal management allowed farmers to raise more livestock per acre. These include the technique of genetic selection as well as the use of specially formulated feed (Andrews et al., 2008). Kosior-Korzecka (2009, p. 3) defines genetic selection as "the selection of animals as breeding stock on the basis of known inherited characteristics." Using this technique, farmers can obtain livestock with genetic traits that increase meat output. The other technique that emerged at this time, the use of specially formulated feeds, involves putting synthetic compounds and antibiotics in animal feed to encourage animal growth and fight diseases, respectively (Andrews et al., 2008). The average time taken to produce a five-pound chicken has decreased from 84 days in 1950 to only 45 days now, due in large part to genetic selection and the use of special feed (Andrews et al., 2008).

The industrialized agriculture system that has emerged is characterized by large farms specializing in single crops. The farm is treated as a factory with inputs such as pesticides, feed, fertilizer, and fuel, and outputs such as corn, soybeans, and meat. Industrial farms exploit economies of scale to increase yields and decrease costs of production (McKenzie, 2007). There is a high concentration of ownership, with a few giant corporations controlling a majority of the

food industry. For example, in 2000, the top five food retailers accounted for 43 percent of sales, up from 24 percent in 1997 (Kaufman, Pothukuchi & Glosser, 2007). In summary, whereas in the nineteenth and early twentieth centuries American agriculture involved many small, diversified farms, the nation's agriculture system now consists of a huge, specialized operations controlled by a few corporations.

### **Adverse Impacts of Current Food System**

While the current industrialized food system has been very effective in producing huge amounts of food at relatively low overall cost, it has a number of major harmful consequences that have become more evident in recent years and have led to the rise of the local foods movement. The areas most heavily impacted are public health, local economies, and the environment. These impacts are individually substantial and collectively outweigh the benefits of the industrialized agriculture system.

### **Adverse Impacts of Current Food System on Health**

Industrialized agriculture has considerable adverse effects on consumer health. One of the primary causes of these effects is the transformation of food production (Pollan, 2006b). In the past, crops fed animals and the animals' manure fertilized the crops. With the rise of industrialized agriculture, animals were moved to Concentrated Animal Feeding Operations [CAFOs], which are areas where animals are fed stored food, usually corn, that fattens them rapidly in preparation for slaughter. This shift resulted in three negative changes: the crops were no longer fertilized by the animals' manure, there was an excess of manure in which the animals were forced to stand, and there was an unnatural change in the animals' diets from grass to corn. While the fertilization issue was addressed by the introduction of chemical fertilizers, the issues of excess animal manure and abnormal diet have led to a number of health problems, most

notably the spread of *E. coli* 0157:H7 (Pollan, 2006b). The corn diet fed to feedlot cattle makes their stomachs the perfect habitat for *E. Coli* to thrive, and with the animals walking around in each other's manure all day, bacteria from one sick cow spread quickly to many others. Farmers in the industrial agriculture system insert antibiotics into the corn to fight problems like *E. coli*, but still the *E. coli* bacteria live in the stomachs of 40% of cattle (Pollan, 2006a). The ingestion of just 10 microbes of *E. coli* is enough to kill a human by destroying the kidneys. Thus, despite the antibiotics and other chemicals put into industrially produced foods, these foods present a great risk to the public health.

Not only is the use of antibiotics ineffective in curing animal diseases, but in fact, it is producing new strains of bacteria that are resistant to drugs. At high levels, antibiotics can treat animal disease just as effectively as they treat human disease (Gilchrist, Greko, Willinga, Beran, Riley & Thorne, 2007). However, most antibiotic use in industrial agriculture is at such low levels that it does not sufficiently fight diseases; rather, it is only meant to promote animal growth. Prolonged use of antibiotics in this way leads to the development of antibiotic-resistant bacteria strains, which can spread to consumers. For example, a bacterium called *Campylobacter*, which can cause paralysis or death in humans, is treated with an antibiotic called fluoroquinolone (Union of Concerned Scientists, 2012). In the past, fluoroquinolone-resistant strains were only reported in people who had taken the drug before, but after fluoroquinolones were approved for use in agriculture, resistant strains of *Campylobacter* began showing up in poultry and humans who had not taken the drug previously. While some might argue that resistant strains of bacteria like *Campylobacter* can emerge due to improper use of antibiotics in other fields, including human medicine and veterinary medicine, agricultural use is the far more significant cause, as it accounts for 70% of the total antibiotics used in the United States (Union of Concerned

Scientists, 2012). It is widely recognized that ending or at least greatly reducing this improper use of antibiotics in agriculture is key to stopping the emergence of antibiotic-resistant bacteria (Gilchrist, Greko, Willinga, Beran, Riley & Thorne, 2007; Union of Concerned Scientists, 2012; Pollan, 2006b).

Another major cause of the adverse health effects of industrialized agriculture involves transportation. In most cases, industrially produced foods are transported great distances and are not available for consumption for some time. To maintain the appearance of freshness, they are processed and refined repeatedly using chemicals. This not only removes nutrients and adds toxic chemicals, but it also “makes food more readily absorbable” by peoples’ bodies, which decreases metabolism (Pollan, 2009, p. xviii). The consumption of highly processed foods has led to “a general decrease in health among all income levels and socioeconomic groups in the U.S.” (Richman, 2010, p. 6), including increasing rates of heart disease, cancer, and most notably obesity. According to a study released by the American Public Health Association, 103 million American adults (43% of the population) will be considered obese by 2018, and United States spending on obesity-related health care will quadruple to \$344 billion (American Public Health Association, 2009). The highly processed foods produced by industrialized agriculture contribute significantly to this problem.

Also, the fact that just a few giant national corporations control most of the industrialized food system makes the system vulnerable to disease epidemics. For example, a single food processing facility can process millions of servings every week; therefore, a disease outbreak at a given facility puts millions of Americans at risk. According to the Centers for Disease Control and Prevention [CDC], the consolidated United States food system sickens 76 million Americans per year, hospitalizes more than 300,000, and kills 5,000 (Pollan, 2006b). While disease

outbreaks may occur in any food system, the industrialized food processing system puts an unacceptable number of American lives at risk.

In sum, the current industrialized agriculture system creates a multitude of health problems. The techniques used in the production and processing stages of industrialized agriculture make the food less nutritious, and the centralized national food system is susceptible to contamination. While some people may buy locally grown foods just to feel more in touch with their community or to taste foods when they are in season and have the most flavor, local foods are a way to try to avoid the serious health problems of the imported foods produced by the industrialized agriculture system.

### **Adverse Impacts of Current Food System on Local Economies**

The industrialized agriculture system hurts local economies because the bulk of its food dollars go to the relatively few mega corporations dominating the system rather than to local farmers who spend the money locally (Perrett, 2007). The value that the local farmers receive for farm products they sell decreases as the degree of processing—which is very high in the industrialized system—increases. For example, in 1980, out of the \$264 billion American consumers spent on food, farmers received \$82 billion or 31% of the total. In 2004, the farmers' share was reduced to about 20% of the \$789 billion spent on food. The remaining 80% went to the processors, wholesalers, distributors, and retailers and for packaging, advertising, and other marketing costs (Perrett, 2007). When farmers make so little profit per food item, they have less money to put back into the local economy.

Michael Pollan discusses the disproportionate amount of food dollars that go to the mega agricultural companies in his book, *The Omnivore's Dilemma*, noting that of a dollar spent on a whole food such as eggs, a farmer receives about \$0.40 (Pollan, 2006a). By contrast, a corn

farmer producing for the industrialized food system receives as little as \$0.04 of every dollar spent on corn sweeteners. Pollan says many farmers have told him the story of the food industry executive who declared, “There’s money to be made in food, unless you’re trying to grow it” (Pollan, 2006a, p. 95).

The lack of profit for farmers drains the economies of the towns in which they live, because the farmers do not have as much disposable income and fewer small farms can survive. This effect has been shown by many studies, which conclude that the economic concentration of the industrialized agriculture system drains a higher percentage of money from rural communities than when the communities consist of mostly small farm operations (Gómez & Zhang, 2000; Durrenberger & Thu, 1996; Foltz, Jackson-Smith & Chen, 2002). In other words, communities benefit more from increasing the number of farms, not simply increasing the volume of food produced by a few farms, as in the industrial agriculture system (Osterberg & Wallinga, 2004).

Another way of viewing the adverse impacts of the industrialized agriculture system on local economies is to consider the positive impacts on the local economy that result from the expansion of local food systems. If consumers purchase food produced within a local area as opposed to imported from outside the area, more of the money from food sales are received by people and businesses within the area. This then generates additional economic impacts as this money is spent locally on not only production inputs, but also other, miscellaneous products being sold locally. (Martinez et al., 2010). This is called the multiplier effect, which is a well-known economic concept (Andrews et al., 2008). Additionally, the creation of local food markets can result in increased local business activity by improving business skills and opportunities (Feenstra, Lewis, Hinrichs, Gillespie & Hickey, 2009).

Many communities have recognized the positive economic impacts of expanding local foods. For example, in 2006, the Woodbury County, Iowa Board of Supervisors adopted a “Local Food Purchase Policy” mandating the purchase of locally grown organic food for events at which food is served (Kaufman, Pothukuchi & Glosser, 2007). The Town of Mt. Pleasant, South Carolina commissioned a local foods study to identify opportunities to support local agriculture for the purpose of encouraging local food entrepreneurs, and supporting agri-tourism and local businesses (“Local Food Assessment,” 2011). Lowcountry Local First, a North Charleston-based non-profit organization, determined that if all the residents in its area of operation committed 10% of their shopping budgets to local merchants, it could generate about \$140 million in total new economic activity, \$50 million in new wages, and more than 1,000 new jobs (Parker, 2009). The economic aspect of the local foods movement therefore is not just about helping farmers keep their jobs, it could also revitalize the economies of towns all across the United States.

### **Adverse Impacts of Current Food System on the Environment**

Many aspects of the industrialized food system result in adverse impacts on the environment. One of the most common harmful techniques of the industrialized food system is growing crops in monocultures. The cultivation of a single crop, says Pollan, “is something nature never does, always and for good reasons practicing diversity instead” (2006a, p. 9). The reason monocultures are never found in nature is that the lack of diversity makes the entire system extremely vulnerable to disease or insects that target a specific crop (Norberg-Hodge & Gorelick, 1998). Thus, the monocrop production requires the input of huge amounts of pesticides and herbicides. When it rains, these chemicals can flow into nearby bodies of water, causing the eutrophication of waterways and poisoning surrounding ecosystems.

Industrial agriculture also contributes to one of the most threatening environmental trends: global warming (“Hidden Costs,” 2008). Many of the practices of industrial agriculture produce large quantities of carbon dioxide, which is the main gas that causes global warming. The carbon produced by the industrialized farms is primarily carbon that was previously in the soil, and which is released into the atmosphere by certain practices of industrial agriculture (Barker, 2007). One such practice is the drainage of wetlands, which is done to create more land to grow crops. Wetlands store carbon in peat and soil, and draining them increases the rate of organic decomposition which in turn increases the rate at which the carbon is released (“Functions of Wetlands,” 2006). Another practice that releases carbon is the deep plowing of soil, which loosens the soil and exposes it to the elements, allowing the carbon to be swept up into the atmosphere (Barker, 2007). On the other hand, carbon can also be released when soil is compacted with heavy machinery.

One of the on-farm practices of industrial agriculture that contributes most significantly to carbon emissions is the use of genetically modified seeds. For thousands of years, farmers have saved their seeds, leading to the development of seeds specially adapted to their environment, often with longer roots that can find moisture deep within soil (Barker, 2007). Commercially produced seeds, on the other hand, which are modified to have higher yields, but which require more water, do not have roots long enough to utilize such sources. As a result, it is often necessary to pump water from deep in the ground up to the surface to irrigate the crops. This process of pumping water requires a great deal of fossil fuels, the burning of which of course releases carbon (“Hidden Costs,” 2008).

Another significant source of carbon emission from industrial agriculture is transportation. On average, food travels 1,500 miles from farm to supermarket (Barker, 2007). Much of the

transportation of foods in the industrialized system is by truck, which contributes to the huge amount of fossil fuels the system uses—accounting for approximately one fifth of the total American use of fossil fuel energy (Pollan, 2010). A 1999 study found that in California alone more than 485,000 truckloads of fresh fruit and vegetables leave the state every year and travel from 100 to 3,100 miles to reach their destinations (Pirog, Pelt, Enshayan & Cook, 2001). The numbers have only increased since then. Barker (2007) found that one-eighth of the world's oil supply is used for transportation, and a large percentage of that is the long distance shipment of food. This fossil fuel use results in enormous amounts of air pollution—especially carbon dioxide. The carbon released in food transportation, combined with that released by groundwater pumping, soil compacting, drainage of wetlands, and a number of other practices of industrial agriculture, accounts for approximately 25% of the world's carbon dioxide emissions (Barker, 2007).

Some of the worst environmental impacts of the current industrialized food system stem from the fact that meat is supplied by Concentrated Animal Feeding Operations [CAFOs]. In addition to abusing animals and making meat less sanitary, CAFOs produce massive amounts of manure that are disposed of in waste lagoons. While CAFOs are a small percentage of the nation's 238,000 feeding operations, they account for more than half of the 500 million tons of manure produced by animals in the United States each year (Kaufman, Pothukuchi & Glosser, 2007). Contaminants from CAFOs enter the environment through a variety of pathways, including leakage from poorly constructed lagoons and overflow from the lagoons during major precipitation events (Aneja, Nelson, Roelle, Walker & Battye, 2003). Many contaminants are present in animal wastes, including nutrients, pathogens, heavy metals such as zinc and copper, and veterinary pharmaceuticals—especially antibiotics (Burkholder et al., 2007). These wastes

pollute the water bodies that they are washed in or that they leak into. There are significant adverse impacts on wildlife, including major fish kills of all species in the affected areas and toxic algae blooms (Burkholder et al., 2007). In total, the effects of the current national food system on the environment are enormous.

### **Local Foods Movement**

The increasing understanding of and publicity about the adverse environmental and health impacts of the industrialized agriculture system, as well as the cruelty to animals associated with it, has fueled the rise of a local foods movement. In the last two decades, the movement has attracted a great deal of attention. The term “locavore” was coined in 2005 by four women in San Francisco who used it to refer to local residents who seek out food produced within a 100-mile radius (Elderkin, 2012). However, food grown within a 100-mile radius is but one of numerous different definitions of “local” food. The 2008 Federal Farm Act defines locally or regionally produced agricultural food products as originating from less than 400 miles away or from within the state in which they are consumed (Martinez et al., 2010). All definitions of “local” food share in common that the distance the foods travel from production to consumption is far less than the average 1,500 miles of the industrial food system. Local foods are also assumed to undergo far less processing and chemical treatment.

Two of the main ways local foods are delivered to consumers are through farmers’ markets and community-supported agriculture operations [CSAs]. In CSAs, people buy shares of an expected farm harvest, and the food shares are regularly delivered to the consumer or to a consumer pick-up location. The phenomenal growth of the local foods movement is shown by the fact that from 1994 to 2009, the number of farmers’ markets—local markets at which farmers sell their food directly to consumers—in the United States increased from 1,755 to 5,274

(Martinez et al., 2010) and that CSAs increased from just 2 in 1986 to 1,144 in 2005 (Adam, 2006). The growth of the local foods movement can also be seen in that major food retailers like Wal-Mart and Safeway now advertise locally produced foods. Restaurants do the same: in 2006, 87% of fine-dining establishments served some local food items, as did 75% of family dining and casual dining restaurants (“Local and Fresh,” 2007). Just as industrialization quickly seized the national food system during the 1940’s and 50’s, the demand for locally grown foods has been rapidly increasing across the United States in the past two decades.

### **National Local Foods Organizations**

Numerous organizations have been involved in the local foods movement, including groups that support local buying generally, environmental groups, animal welfare groups, agriculture departments of some universities, and the federal and state agriculture departments. The modern local foods movement has its roots in early networks of food cooperatives and natural foods groceries. In 1999, a regional grassroots organization, Community Involved in Sustaining Agriculture [CISA], launched its “Be a Local Hero/Buy Locally Grown” campaign in two counties in Massachusetts (Damian, Holloway & Kneafsey, 2007). FoodRoutes Network, a national organization, used the techniques developed by CISA to initiate a Buy Locally Grown campaign in which it worked with numerous local organizations throughout the country.

The Slow Food organization was an inspiration for the local foods movement in the United States. Founded in Italy in 1986 as a protest against the arrival of McDonald’s in Rome, it encourages people to form small “food communities,” eat food grown through sustainable agriculture techniques, and be generally more conscious of what they are eating and where their food originated. It now has more than 100,000 members in 132 counties (Pollan, 2010). Another important organization in the local foods movement is Chefs Collaborative, which works with

culinary professionals to encourage use of local foods. It has more than 3,000 members, 70% of whom are chefs (Appel, 2008). Two organizations that have conducted numerous studies on topics on or related to local foods are the Leopold Center for Sustainable Agriculture, which is an Iowa State University farm research group (“Leopold Center,” 2012) and the Appalachian Sustainable Agriculture Project, which is a non-profit organization based in Asheville, NC (“Appalachian Sustainable,” 2012). Two prominent journals on the local foods movement are *Environmental Health Perspectives* and *The Journal of Agriculture, Food Systems and Community Development*.

In the last few years, the United States Department of Agriculture has undertaken a number of initiatives to assist with local foods. For example, in May of 2010, the Department issued a comprehensive report on local food systems (Martinez et al., 2010) and in 2010 and 2011, it helped fund the construction of over 4,200 high tunnels—greenhouse-like structures—on farms around the country to extend the season for local food production (Vilsack & Merrigan, 2012). These national efforts, both private and public, on behalf of local foods have not only achieved specific results, but collectively have stimulated national and even international interest in local foods.

### **Local Foods in Charleston**

As demonstrated by the coming of GrowFood, interest in local foods in Charleston has been rising in recent years. According to South Carolina’s Department of Agriculture, there are ten community-based farmers’ markets in Charleston County, including five in the city of Charleston, one in Mount Pleasant, one in North Charleston, one on James Island, one on Johns Island, and one in Awendaw (“Community-based Farmers Markets”, 2012).

The county also has eleven CSAs, including three in Charleston, two in Mount Pleasant, four on

Johns Island, one on Wadmalaw Island, and one in McClellanville (“Community Supported Agriculture (CSAs)”, 2012). Farmers’ markets and CSAs provide farmers with easy-to-use marketing outlets, and their increasing numbers in Charleston County show that the local food infrastructure in the area is growing.

As for local farms, the researcher could not find a listing of all the farms in the Charleston area that market their food locally. The most comprehensive list was that on the GrowFood website which lists the farmers currently working with the food hub. Of the 30 farmers, 11 are located in Charleston County (“How It Works”, 2012). There are certainly numerous other local farmers who do not work with GrowFood, but they are not registered collectively anywhere.

On the demand side of the food infrastructure, there are many restaurants that are currently using locally grown food. On its website, GrowFood lists 128 restaurants in the Charleston area that are currently buying food from the food hub. These include 57 in North Charleston and downtown Charleston, 21 in Mount Pleasant, Sullivan’s Island, Isle of Palms, and Daniel Island, 12 on James Island, Johns Island, Kiawah Island, and Folly Island, 5 in West Ashley, and 33 that are mobile or have multiple locations (“Where to Find It”, 2012). These are only the restaurants that work with GrowFood, and there are surely a number of others that do not currently work with GrowFood.

In recent years there has been a noticeable increase in the number of restaurants offering locally-grown foods, particularly restaurants located in downtown Charleston. This is likely due to the fact that local and organic foods are becoming popular among students attending the College of Charleston, and thus the surrounding restaurants have started using local foods in order to attract this key demographic. One downtown restaurant in particular, Husk, has received

a lot of attention for its use of local foods, and it was even the subject of an article in The New Yorker (Bilger, 2011).

With regard to organizations involved in the local foods movement in Charleston, there are two main groups, one of which of course is GrowFood Carolina. In addition to aggregating and selling local food, GrowFood provides a number of other services to farmers. One such service is staying informed on the fluctuating market prices of the many different foods the farmers provide, which is something that farmers do not usually have time to do. Through this service, GrowFood ensures that the farmers will get the most profit out of their product (Clow, 2012b). Also, because GrowFood acts as a middleman between farmers and buyers, it can effectively match the foods needed by buyers around town with foods farmers have grown or can grow (Clow, 2012b). Another crucial service the food hub provides is cold storage for crops. The cooler at the warehouse is very important because it keeps crops fresh and increases the marketing window, or the time that a food can be stored while its purchase is being worked out.

In addition to these services provided directly to the farmers, GrowFood also works to increase interest in local foods in Charleston. It uses signage in stores to direct people to the local food sections, it advertises on the radio, and it has held public events at the warehouse (Clow, 2012b). GrowFood also labels the foods as “Certified SC Grown” to encourage people to buy local, and often will also provide the name of the farm where food was grown to create some publicity for the farmer.

The other major player in the local food movement in Charleston is Lowcountry Local First [LLF]. LLF is an organization based in Charleston that works to encourage people to buy local products through numerous campaigns, events, and initiatives. One of its two main initiatives, “Eat Local,” focuses on advancing local foods in Charleston both by maximizing the

supply and by increasing the demand. On the demand end, the Eat Local initiative, headed by Nikki Siebert, has advertised heavily for local food consumption and set up numerous events to familiarize people with the benefits of buying locally-grown foods.

On the supply end, Eat Local has created several programs designed to increase farmers' productivity and increase the number of local farmers. To assist farmers who have been farming for less than ten years, there is the New and Beginning Farmer Program ("Eat Local", 2012). LLF worked with Clemson University to create this program that aims to give farmers the tools and knowledge they need to be successful in growing their food and marketing it effectively. It consists of monthly workshops as well as tours of successful farms. Another program that helps local farmers get started is the Apprenticeship Program, in which aspiring farmers work either part-time or full-time on successful farms, experiencing all aspects of farming from seeding and soil preparation to harvesting and delivering to market ("Eat Local", 2012). In addition, there is the recently initiated LLF Incubator Farm. Another product of LLF partnering with Clemson University, the Incubator Farm provides a low-risk incubation period for new farmers, where they are not overwhelmed by high equipment costs, increasing regulations, and a lack of affordable land, all of which will be handled by the program ("Eat Local", 2012). The farm consists of ten acres of land divided for use by six farmers and with one acre allocated for a teaching plot for apprentices, students, and the public. It allows farmers to share equipment and resources and also guarantees them mentorship from an experienced farmer for a three-year incubation period.

### **Chapter III: Methodology**

Across the country, efforts are being made to integrate locally grown foods into the consumer infrastructure (Martinez et al., 2010). These efforts are motivated primarily by the public's increasing awareness of the harmful effects of the current industrial agriculture system on consumer health, city and state economies, and the environment (Pollan, 2006a). In Charleston, South Carolina, groups such as Lowcountry Local First and GrowFood Carolina are attempting to connect local farmers to consumers, but they require additional data to help guide these efforts. Therefore, the governing question of this thesis is: How do farmers in the Charleston area currently access local consumers, what are the barriers to their entry into the local food market, and how could GrowFood Carolina act to help them overcome these barriers? The first part of this question was addressed through the compilation of pre-existing raw, quantitative data regarding the operations of local farms. The researcher answered the second part of the question by conducting interviews with farmers by phone. The third part of the question was dealt with through an analysis of the needs reported by farmers compared with what services GrowFood provides or could potentially provide. The principal material was the raw data from questionnaires, distributed by GrowFood, which local farmers had completed. The quantitative data showed primarily how farmers in South Carolina currently access local consumers, while the qualitative data revealed the challenges the farmers face and the options GrowFood has for meeting these needs in the future.

#### **Participants**

The study used 29 farmers whose farms are within approximately 120 miles of Charleston and who agree to participate. The researcher retrieved farmers' contact information either from the questionnaires distributed by GrowFood or directly from Sara Clow, and they

were recruited over the phone. Gender, age, and ethnicity did not affect this study. The motivation factor for farmers' participation was the possibility of having their needs met and potentially gaining increased access to local consumers.

### **Materials**

The primary materials that were used were 29 completed questionnaires which were designed by Sara Clow and distributed online and in the mail to local farmers. The questionnaire contained 15 questions that assessed the quantitative aspects of farm operations, such as the number of acres under irrigation and the percentage of sales that came from different marketing outlets (see Appendix for sample questionnaire). The other materials included a smart phone with a call recording app to record interviews of farmers and Microsoft Excel to compile the quantitative data.

### **Procedures**

The first phase of the data collection focused on the quantitative data. First, the researcher collected all of the completed questionnaires both in print and online. The farmers' names, along with their answers to the 15 questions, were put onto a Microsoft Excel Spreadsheet. An additional column was placed at the end, labeled "Working with GrowFood Carolina," which the researcher answered for each farmer with either a Yes or a No. Once the spreadsheet was finalized, the second phase began.

The second phase collected qualitative data. Using the phone numbers from the questionnaires as well as some numbers provided by Ms. Clow, the researcher called 13 local farmers. A call-recording app was downloaded onto the researcher's smart phone to record the calls. If a farmer was willing to participate, the researcher asked several open-ended questions to try to understand what the farmer's needs were and what changes he or she thought would help

meet those needs. The two core questions were: “What are the top three challenges you face in marketing your food locally?” and “What is your opinion of GrowFood Carolina?” Follow-up questions varied based on each farmer’s responses. After the calling was complete, the key information from each interview was transcribed into a Microsoft Word document.

When the data collection was complete, the researcher analyzed the results. The quantitative data showed how local farmers accessed local consumers, either at farmers’ markets, through CSAs, through GrowFood, directly to restaurants, or through other marketing outlets. Analysis of the qualitative data primarily revealed the challenges the farmers faced in growing their food and marketing it locally and what GrowFood could do to help them overcome these challenges.

### **Evaluation**

The success of this thesis was determined by how well the farmers were able to articulate their needs and other qualitative information and whether or not the researcher could make recommendations for how to act on this data. The farmers interviewed were in fact very effective in expressing themselves, and so in that sense the data is valid and the thesis succeeded. However, there was a relatively small sample size consisting of only 13 interviewed farmers, and this detracts—though only slightly—from the data’s validity. For the quantitative data, the farmers responded within the parameters of each question and the numbers they gave almost always added up, making that aspect of the thesis valid and successful as well.

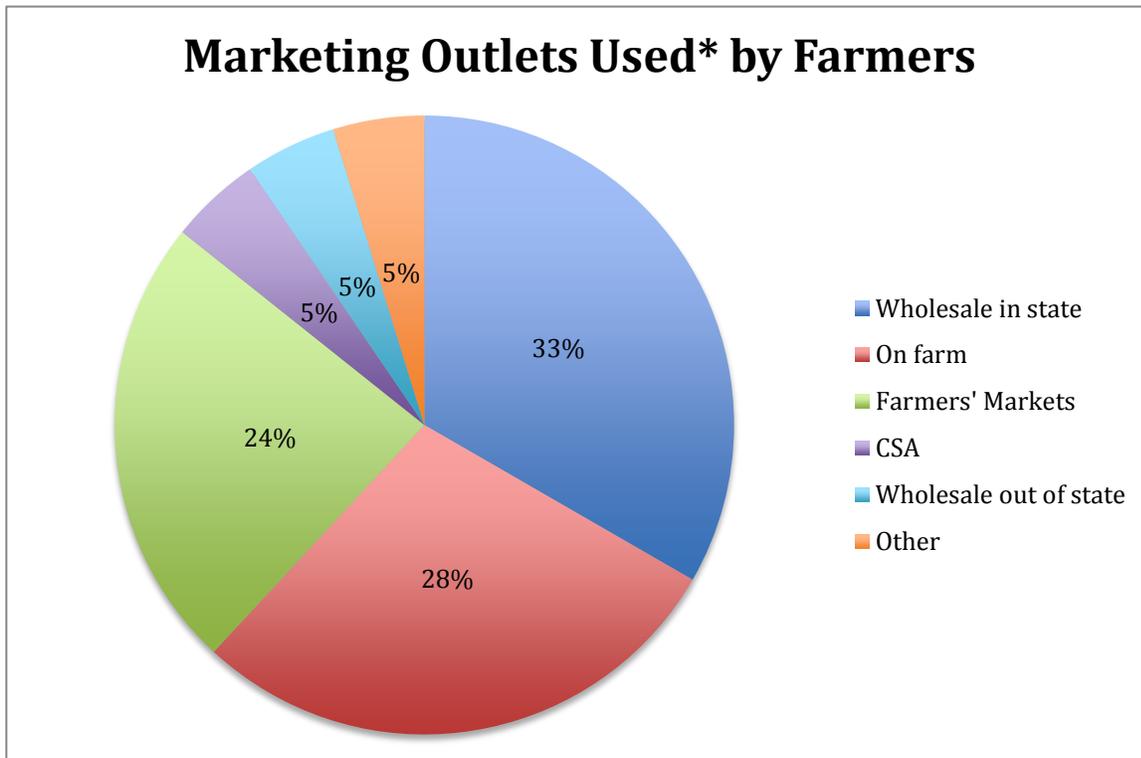
### **Conclusion**

The quantitative data shows that the marketing outlets most commonly used by local farmers are wholesale in state, on farm sales, and farmers’ markets. The qualitative data suggests that the major problems the farmers have stem from a misunderstanding of the services

GrowFood provides. Most of the issues they reported are already dealt with by GrowFood, which shows that the farmers do not have truly unaddressed needs, but are rather just confused as to how the food hub works.

## Chapter IV: Presentation of Findings

### Current Marketing Outlets of Farmers in the Charleston Area



\*To be included in the calculation, a given marketing outlet must constitute at least 20 percent of an individual farmer's total sales

The chart above shows the percentages of the 29 surveyed farmers who use each marketing outlet to sell their crops. The outlets listed as "other" include selling directly to restaurants and to retail produce distributors.

### Challenges Faced by Local Farmers

#### Accessing New Customers

6 out of 13 farmers reported this challenge

Almost half of the farmers said that one of their main difficulties was reaching out to new customers. Traditional advertising like billboards and television advertisements are effective in

reaching consumers, but they are too expensive. Labeling the food as locally grown and giving the farm name is also effective in raising interest in local foods, but some farmers are afraid that if they label their food then one bad batch of crops could ruin them.

#### Using Reverse-Pricing

6 out of 13 farmers reported this challenge

Most of the farmers do not have much market knowledge and do not know exactly how much they should charge for any given food sale, which means they have to see what the buyer will offer them for the product. This is called reverse-pricing, and it requires blind trust on the farmers' part, because they must rely on the buyers to not try to shortchange them. Restaurants in particular try to get exceedingly low prices.

#### Making Deliveries

5 out of 13 farmers reported this challenge

Making deliveries is costly and time-consuming for small and mid-sized farmers who don't have many employees. They can end up having to charge a lot for small amounts of food to cover the cost of the delivery. The difficulty of making deliveries can keep farmers from selling to certain buyers that do not order large enough quantities to make the sales worthwhile.

#### Competing with Imported or Conventional Foods

3 out of 13 farmers reported this challenge

Food grown on small to mid-sized farms costs more to the farmers to grow than does food that is mass-produced on huge farms and exported around the country. Having to compete with this cheaper, imported food forces smaller farmers to either significantly lower their prices or accept making fewer sales. Both options reduce the profit to local farmers. They may try to educate consumers about the benefits of eating locally-grown food, but as one farmer said, often

people are “just looking for the price” (Oxner, 2012). For farmers whose crops are certified organic, the same problem arises because they must compete with farmers selling “conventional”—not organic—food that was cheaper to grow.

#### Miscommunication with Buyers

3 out of 13 farmers reported this challenge

Many farmers grow crops for particular buyers, and several farmers said that occasionally the buyers they grew crops for would not want the crops once they were harvested. A few farmers said that they had problems communicating about sales with GrowFood. One farmer said that he tried to contact GrowFood and never heard back.

#### Finding Cold Storage Space for Crops

2 out of 13 farmers reported this challenge

The longer crops can be kept in cold storage, the more time there is to find a buyer and sell them for a good price. It also makes the food fresher, which gives the farmer a good name. It is therefore important for farmers to have cold storage space in which to keep their food. A few farmers said that they did not have enough or any such storage for their crops. One farmer who was working with GrowFood said that the cooler did not always have room to accommodate his crops.

#### Knowing Which Crops Are in Demand

1 out of 13 farmers reported this challenge

One farmer said that he had difficulties selling certain crops, like eggplant, because they were not in high demand in South Carolina. It is important for farmers' crops to be in high demand, because otherwise they likely cannot sell them at much profit if they can sell them at all.

### **Positive Features of GrowFood Carolina Reported by Farmers**

#### GrowFood Increases Farmers' Access to Large Buyers, Especially Restaurants

GrowFood aggregates the food it receives and sells it in large quantities to fill the larger orders of buyers like restaurants. This is extremely helpful to small and mid-sized farmers who could not fill large orders on their own. Many farmers said that working with GrowFood gave them access to restaurants whereas they did not have such access on their own.

#### GrowFood Handles Price Negotiation with Buyers

A majority of the local farmers interviewed feel uncomfortable using reverse-pricing when making sales directly to buyers. GrowFood helps address this problem by handling the price negotiation with the buyers. The employees at GrowFood stay up-to-date on what the market prices of crops are, and farmers feel confident that GrowFood will get them the best possible prices. Farmer Fritz Aichele, for example, said, "As a farmer...I don't have time to figure out how to price [the food]...With GrowFood, I know the price is always as much as they can possibly get" (Aichele, 2012).

#### GrowFood Labels Farmers' Products and Gives Them Wide Exposure

GrowFood labels the food that it sells as "Certified SC Grown." It also provides signage for grocery stores that points consumers in the direction of the local food. Both of these tactics raise consumer awareness about local foods and encourage them to spend a little more on locally-grown food as opposed to buying cheaper imported food. GrowFood also often provides the name of the farm on which certain crops were grown when selling to certain buyers. This information can show up on restaurant menus, for example, and when patrons identify the tasty food they are eating with the name of a local farm, it raises their interest in local foods and increases the likelihood that they will seek out food from that specific local farm.

### GrowFood Has Comprehensive Market Knowledge

GrowFood knows what food is needed to fill different orders in the Charleston area, and it also knows which farmers can supply those orders and when they can do so. With extensive knowledge of both the supply and the demand, GrowFood can effectively tell farmers what and how much to plant to maximize their collective efficiency. This system also keeps farmers from undercutting each other by doing things like growing the same crop in the same area and potentially flooding the market by accident.

### **Problems of GrowFood Carolina Reported by Farmers**

#### Miscommunication About which Crops to Grow

A few farmers said that they had problems with miscommunication with GrowFood. GrowFood told them to grow certain crops, and then once the crops were harvested, GrowFood either canceled the orders or had them filled by other farmers. One farmer said that he stopped working with GrowFood because he felt out of the loop.

#### Volume Constraints

GrowFood is a new organization, and currently it can only work with certain amounts of food. Some farmers said that GrowFood was not able to sell all of the food that they, the farmers, brought. Also, a few farmers reported that GrowFood on more than one occasion did not have sufficient room in its cold storage unit for the farmers' crops, and so they could not sell the crops. The farmers who reported this problem noted that GrowFood is still growing, and it will simply take time before it can accommodate larger quantities of food.

## Chapter V: Discussion

In the last 60 years in the United States, the practice of small-scale farming has been replaced by commercial farming on a massive scale that relies on transporting food across the country. Today the farm is treated like a factory, with agricultural corporations trying to get the most amount of output—foods like beef, wheat, and chicken—for the least amount of input—including fertilizers, antibiotics, and feed. While these methods have succeeded in making food production in the U.S. much more efficient, this result has come at a high price, causing significant adverse effects on consumer health, local economies, and the environment.

In response to the negative consequences of the current industrialized food system, the local foods movement was born. The goal of the movement is to work with both the supply and the demand for locally-grown foods, encouraging consumers to buy food within a certain distance of where they live while at the same time using systems like farmers' markets and Community-Supported Agriculture operations to help small and mid-sized farmers sell more of their food locally. Contributing to this movement, in October of 2011 the Coastal Conservation League created GrowFood Carolina, a food hub, in Charleston, South Carolina to help local farmers access the consumer market more efficiently. However, GrowFood is still a new organization that needs information on how farmers access consumers and what their needs are. To try to provide that information, the researcher designed this thesis, with the governing question being: "How do farmers in the Charleston area currently access local consumers, what are the barriers to their entry into the local food market, and how could GrowFood Carolina act to help them overcome these barriers?"

To address the first part of this question, the researcher compiled data from questionnaires that had been completed by 29 local farmers. Among the questions were several

regarding sales percentages that revealed what marketing outlets each farmer used. To address the second part of this question, the researcher conducted a survey by phone with 13 farmers that primarily showed the obstacles they faced as farmers and their opinions regarding GrowFood. The third segment of the governing question was addressed through analysis of the data on local farmers' common issues.

The quantitative data compiled from the questionnaires showed that the three marketing outlets most used by the surveyed farmers were wholesale in state, on-farm sales, and farmers' markets, which were used by 33, 28, and 24 percent of the farmers, respectively. CSAs, wholesale out of state, and "other," were each only used by five percent of the farmers. This is not extremely surprising in retrospect, because CSA's are often hard for farmers to gain access to; wholesale out of state is not an outlet from which a small or mid-sized farmer could make a lot of profit selling small quantities of food; and the outlets that went under "other," including sales directly to restaurants, sales made to family, are all unusual outlets for local farmers to use. While expected, this information is nonetheless significant because there is hardly any other information about the preferred marketing outlets of farmers in the Charleston area.

The qualitative data revealed the challenges faced by local farmers as well as what they saw as the positive and negative features of GrowFood. The challenges the farmers reported fell into seven categories: accessing new customers, using reverse-pricing, making deliveries, competing with imported or conventional foods, miscommunication with buyers, finding cold storage space, and knowing which crops are in demand. The four main positive features of GrowFood were that it increases farmers' access to large buyers, handles price negotiation, labels farmers' food and gives them wide exposure, and has comprehensive market knowledge. The only two negatives farmers reported were that GrowFood is still too small to successfully

handle all the food it is receiving and that there were occasional instances of miscommunication.

Of the challenges reported by the farmers, only two cannot be addressed by GrowFood. The first is making deliveries. The purpose of a food hub is to act as an aggregation point where numerous farmers can bring their food, and it would be very impractical for GrowFood to take on the responsibility itself of moving the foods from the numerous farms to the GrowFood warehouse. The other problem that GrowFood does not address is competition with the low prices of imported foods. This difficulty is inevitable for small and mid-sized local farmers, because their foods simply cost more to produce than do mass-produced, imported foods. While GrowFood can try to encourage people to pay a little more for local foods as opposed to imported foods, there is nothing it can practically do on the supply end to lower the cost to the farmer enough to make the prices even.

The other challenges reported by the farmers were surprising in that it was not only possible for GrowFood to deal with them, but in fact it already does deal with all but one of them. For example, the most reported problem was accessing new customers. GrowFood currently has enough buyers that the demand is even greater than it can supply. Farmers who work with the food hub should not have a problem accessing new customers, because GrowFood always has a buyer waiting to purchase any crop that is in demand locally. The second-most-reported problem was having to use reverse-pricing. GrowFood is a non-profit organization, which means that it has no reason to exploit reverse-pricing to try to underpay farmers for their crops. Thus, this is not an issue for farmers working with GrowFood. Another problem GrowFood already handles is the need for cold-storage space for crops. The cooler at the warehouse in downtown Charleston has more than enough space to accommodate the food from all of the farmers that currently work with GrowFood, so in that sense there are no volume

constraints. As for the problem of farmers knowing which crops are in demand, GrowFood creates a document called a demand document which says, week-by-week, what foods it needs. Farmers then plug their products into the schedule.

The reporting of problems that GrowFood already addresses was to be expected from farmers who do not currently work with GrowFood. After all, GrowFood was designed to address the common obstacles among small and mid-sized farmers, so for farmers who do not yet work with GrowFood, the majority of those obstacles remain. What was unexpected was that these problems would also be reported by farmers who do currently work with GrowFood. The fact that a number of farmers who work with GrowFood would report issues that the organization already deals with suggests that farmers are confused as to what services GrowFood provides. Furthermore, miscommunication was reported not only as a challenge to farmers but also as a negative aspect of GrowFood. This makes sense when considering the farmers' preferred marketing outlets. Two of the three most-used marketing outlets—on farm sales and farmers' markets—are direct systems in which the farmer interacts face-to-face with each consumer when selling the food. For farmers who have relied for years on these straightforward marketing outlets, making the shift to a slightly more complex outlet—a food hub—can be difficult at first and hard to understand. Thus, the problems came not from GrowFood lacking crucial services, but rather from the farmers having difficulty adapting to a new system.

To deal with the problems reported by the farmers who do not currently work with GrowFood, the solution is as simple as reaching out to them, explaining how working with GrowFood would help them overcome the obstacles they face as farmers, and incorporating them into the food hub. To handle the confusion among farmers who are working with GrowFood, the focus needs to be on communication. It is sometimes difficult for farmers to be informed about

GrowFood's operations—both fundamental and day-to-day—because they are usually very busy and may not have time to regularly check their emails and phone messages. This is an issue that GrowFood cannot completely avoid and must simply deal with in order to function with maximum efficiency. There are several different ways that GrowFood can address this problem.

First, every farmer should be given a brief tour of the GrowFood warehouse, during which time a GrowFood employee—preferably general manager Sara Clow—explains the process step-by-step. This needs to be done even if a farmer starts working with GrowFood late in the season, and can take place when they make their first delivery. It would also be beneficial to create a pamphlet<sup>1</sup> containing information on the functioning of GrowFood as it relates to the local farmers. While it may seem unnecessary considering that this is explained on the GrowFood website, there are various reasons why a farmer might not look at the website: they may not have internet, they may not have the time or perhaps the patience to navigate a web page, or they might just prefer to have something solid that they can refer to. Another action that would help minimize miscommunication is for Ms. Clow to explain very clearly to farmers that the food on the demand document is what GrowFood can definitely sell, and as for any food farmers deliver that is not on the document, there is no guarantee that it can be sold for a good price if at all.

If GrowFood makes these changes, it could yield a number of benefits for local farmers. There would be less confusion about the services GrowFood provides. This is important because when farmers do not realize that GrowFood offers a service like refrigeration for crops, they do

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<sup>1</sup> In the time since the data was collected, GrowFood created such a pamphlet. Nonetheless, the recommendation is still included because it is relevant to the functioning of food hubs in general.

not utilize the resource and end up either wasting money on renting a cold storage unit or simply not selling as many crops. In addition, if GrowFood acts to make sure all farmers, especially newcomers, understand the food hub's operations, it will make it easier for future farmers to transition into working with GrowFood. A smoother transition is significant because it allows new farmers to more easily adapt to working with GrowFood and more quickly begin operating at their maximum efficiency. This would also encourage more farmers to work with GrowFood in the first place, because it would be very easy for them to start. Another benefit for farmers is that there would be fewer mishaps where farmers brought food for which GrowFood did not already have a buyer. These kinds of mistakes are unnecessary and very unfortunate because they allow good local food to potentially go to waste.

These changes would also be advantageous for GrowFood. Less miscommunication would make GrowFood seem more professional. It would earn even more respect as an organization, and farmers would likely follow GrowFood's advice more frequently about which crops to grow. If the farmers listen more to GrowFood's advice, it will lead to fewer instances of farmers growing the wrong foods, which will help GrowFood seem more professional, creating a self-perpetuating cycle of positive results. One of the most important benefits for GrowFood is that these changes would make farmers generally more satisfied with the functioning of the food hub. This of course is beneficial on its own because it reduces the stress farmers go through and makes their jobs and lives easier. In addition, it could encourage more farmers to work with GrowFood as the word of its success spreads amongst local farmers. GrowFood is already functioning well and it is growing quickly, but the data from the questionnaire and survey indicate that these changes would help it function even more smoothly and efficiently.

While the gathering of the data went even better than was expected, there are still a few

limitations to the research. One such limitation is that a few of the farmers may have filled out the questionnaires inaccurately. This was made apparent by the fact that, for a few farmers, the sales percentages did not add up to 100 percent. Still, this was not a significant issue because this thesis analyzed which marketing outlets were used significantly by farmers, so what was important was whether or not farmers used an outlet at all, not exactly what percent of their sales it was. Another limitation is that of the more than 30 farmers who were called, only 13 answered their phone and agreed to be interviewed. This is a relatively small sample size. In addition, the small sample size made it impossible to accurately determine if there were any correlations between problems reported by farmers and data from the questionnaire including acreage harvested, number of full-time employees, and type of farming (conventional, certified organic, etc.). This is an area that could be examined by a future study.

The aim of this thesis is to enhance the functioning of GrowFood Carolina by providing it basic information about the farmers it serves and recommendations on improving its services. This basic information provided by this thesis should help Growfood better understand the needs of its clientele. The recommendations of this thesis on improving communications between GrowFood and the farmers it serves, if implemented, should improve the group's operations and enhance its reputation. The significance of the data produced by this thesis extends beyond helping GrowFood, because it provides information on the strengths and weaknesses of the local food hub system, which is a promising concept that could greatly expand the access of small and mid-sized farmers to local consumers across the country and even around the world. For the local food movement to succeed, the entire process of growing and marketing local foods needs to be made as efficient as possible, and these findings are but one small step toward realizing that hope.

**Appendix****Fruit & Vegetable Grower Survey****Section A: Basic Information:**

Your Name:

Farm Name:

Farm Address:

Email:

Phone Number:

**Section B: Farm Information:**

1. What is the total acreage of your farm? \_\_\_\_\_
2. What is the current harvested acreage of your farm? \_\_\_\_\_
3. Of your total acreage, how many acres are available for crop production? \_\_\_\_\_
4. Is your land owned or leased? (Circle One) OWNED LEASED
5. If leased, what is the lease term? \_\_\_\_\_
6. Are you currently irrigating? (Circle One) YES NO
7. How many acres are currently under irrigation? \_\_\_\_\_
8. What is your irrigation source? (Circle One) WELL SURFACE OTHER
9. What method of irrigation are you using? (Circle One) DRIP GRAVITY SPRINKLER
10. What percent of your sales come from:
  - a. Wholesale
    - i. Wholesale in state % \_\_\_\_\_

ii. Wholesale out of state % \_\_\_\_\_

b. On Farm Sales (Roadside, Upick, Drop in) % \_\_\_\_\_

c. CSA Shares: % of sales \_\_\_\_\_ # of Shares? \_\_\_\_\_

Dates Available? \_\_\_\_\_

d. Farmers Market % of sales \_\_\_\_\_

e. Other Markets – Please list:

\_\_\_\_\_ % of sales \_\_\_\_\_

\_\_\_\_\_ % of sales \_\_\_\_\_

\_\_\_\_\_ % of sales \_\_\_\_\_

11. Please indicate what crops you are growing annually:

<b>Product</b>	<b>Number of Growing Seasons (1, 2, 3)</b>	<b>Harvested Acres Per Product</b>
<b>Bell Pepper</b>		
<b>Lima Beans/Butter Beans</b>		
<b>Cabbage</b>		
<b>Cantaloupe</b>		
<b>Carrots</b>		
<b>Collards</b>		
<b>Cucumbers</b>		
<b>Snap Beans</b>		
<b>Green Peas</b>		
<b>Onion</b>		

<b>Kale</b>		
<b>Mustard Greens</b>		
<b>Okra</b>		
<b>Potatoes</b>		
<b>Summer Squash</b>		
<b>Sweet Potatoes</b>		
<b>Tomatoes</b>		
<b>Turnips</b>		
<b>Watermelon</b>		
<b>Blueberries</b>		
<b>Figs</b>		
<b>Peaches</b>		
<b>Pecan</b>		
<b>Strawberries</b>		
<b>Other</b>		

12. What are your current farming practices?

a. Certified Organic

b. Conventional

c. Other: Organic not certified, Permaculture, Hydroponic

13. How many employees (including self):

a. Full Time \_\_\_\_\_

b. Part Time \_\_\_\_\_

c. Seasonal \_\_\_\_\_ Number of weeks employed? \_\_\_\_\_

14. Are you a member of a Co-Op? Circle One YES NO

a. If YES, which Co-Op? \_\_\_\_\_

15. Additional Comments

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