

**SUSTAINABLE CAMPUS FOOD PROCUREMENT: AN ASSESSMENT AND  
RECOMMENDATION OF DINING PURCHASING AT THE COLLEGE OF  
CHARLESTON, CHARLESTON SC**

**A thesis submitted in partial fulfillment of the requirements for the degree**

**MASTER OF SCIENCE**

**in**

**ENVIRONMENTAL STUDIES**

**by**

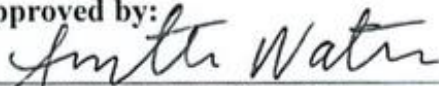
**ASHLYN SPILIS HOCHSCHILD**

**APRIL 2016**

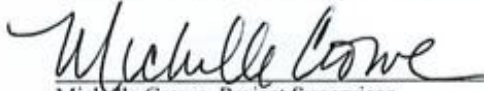
**at**

**THE GRADUATE SCHOOL OF THE UNIVERSITY OF CHARLESTON, SOUTH  
CAROLINA AT THE COLLEGE OF CHARLESTON**

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**ABSTRACT**

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This thesis seeks to compile produce and meat purchases made for one academic semester, research these purchases to determine origin, compile the percentage of food considered sustainable by the standards required by the Association for the Advancement of Sustainability in Higher Education (AASHE), and calculate greenhouse gas emissions of these purchases by using the CHarting Emissions From Food Services (CHEFS) tool. Using a descriptive data methodology, this research project tracked produce and meat purchases from origin to institution. The results of this study include the percentage of purchases considered sustainable and recommendations on how to increase this number. The current food system's lack of transparency makes assessment of food difficult; more information on tracking, as well as impacts of these purchases remains an important need for the field of campus sustainability.

## Copyright Page

## Acknowledgements

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## *Introduction and Literature Review*

Reforming social and environmental systems at the campus level are imperative to transitioning to a more sustainable society. Since the Stockholm Declaration of 1972, the need for increasing the understanding of ecological and social impacts at the college level has grown. The first international declaration to connect higher education and sustainability, this document also further influenced future declarations, most notably the Tbilisi Declaration of 1977. Finalized at the United Nations Educational, Scientific and Cultural Organization (UNESCO) and United Nations Environment Programme (UNEP) Intergovernmental Conference on Environmental Education, the declaration "provides the background for the first formal international sustainability initiatives in higher education" (Grindsted, 2011; 31). This emphasis for sustainable research and action was further pushed by the United Nations' Decade for Education for Sustainable Development (DESD) from 2005-2014 as well as the Graz Declaration, which encouraged colleges to further research and collaboration to address needs to solve issues within sustainability (Alshuwaikhat and Abubakar, 2008, 1778; Grindsted, 2011; 34; Krizek, et. al., 2012; 20; Lozano et. al, 2014; 17).

Institutions of higher education play an enormous role in developing research and policy in the field, implementing solutions to interconnected environmental and social problems on multiple scales, as well as preparing students to become active citizens post-graduation (Button, 2009; 280; Dyer and Dyer, 2015; 5; Hoover and Harver, 2014;176; Polluck, et. al., 2009; 352). Wigmar and Ruiz (2010) note that:

As higher education institutions, colleges and universities have a public responsibility to generate and transmit knowledge to society as a whole, as well as



an economic and social responsibility regarding resource management; hence the importance of specifically analyzing their socially responsible behavior (25).

Many of the ways campuses have begun to assess and minimize impacts is through research into carbon neutrality and reducing their overall carbon footprints (Abdul-Azees and Ho, 2015; 17; Worth, 2005; 7). One of the most popular methods for beginning this process is signing the American College and University Presidents' Climate Commitment (ACUPCC), which requires an assessment of current carbon emissions at the campus level, developing a framework for lowering emissions, and the establishment of transparent plans to reduce impacts. These plans must also be available for other colleges to review through the Association for the Advancement of Sustainability in Higher Education (AASHE) (Breen, 2010; 686; Dyer and Dyer, 2015; 2). As of 2016, forty-seven campuses had uploaded their greenhouse gas emission inventories to AASHE (AASHE, "Campus GHG Inventories"; 2016). The College of Charleston in Charleston, South Carolina has signed this commitment, as well produced a greenhouse gas report in 2012 and 2015 (Fisher, et al., 2012; Fisher, et. al, 2014). For many colleges and universities, utilizing these assessment tools can help increase future sustainable efforts. While the ACUPCC brings awareness to the need to set and pursue carbon neutrality goals, the initiative currently does not include emissions from procurement (Dyer and Dyer, 2015; 3, 5).

Including the topic of food into campus sustainability efforts is relatively new for most universities, in part because of its complexity. A comprehensive food purchasing assessment can include the type of food being purchased, where food is originating from and how far it traveled to campus, calculating the impact of these purchases, as well as how to increase the percentage of sustainable options (Bartlett, 2011; 101). Campus food

sustainability efforts fall under a wide spectrum; while many colleges are just beginning to incorporate food into the sustainability picture, others are growing food used in the dining halls. At the beginning of the spectrum universities are starting the process of including food in their sustainability plans and efforts. The University of Massachusetts Dartmouth has included food as a part of their Sustainability Action Plan (2010) and Appalachian State published a study on the benefits of locally grown food (Baines, 2008). Similarly, research into a more sustainable food system at UC Berkeley was completed in 2009 (Salvini, 2009). The University of California Santa Cruz has begun investigating food procurement and waste disposal of their dining halls (2007) and Yale University has compiled a sustainable food purchasing guide (2007). Using qualitative research methods, Meg Guiliano (2010) interviewed major players at Duke Dining Services to assess barriers and opportunities for sustainable food purchasing (16).

Moving beyond just including food in sustainability efforts, examples exist in the literature of campuses beginning to assess the percentage of food considered "sustainable." These calculations typically use standards set by one of two main organizations defining sustainable food for institutions: the Real Food Challenge and the Association for the Advancement of Sustainability in Higher Education (AASHE). Samantha Meyer tracked food purchasing for one dining hall for a month at Pomona College (Meyer, 2009), then used the Real Food Challenge Calculator to assess the percentage of food that could be considered sustainable (Meyer, 2009; 46). Similarly, the University of Maryland (Lilly, 2011) conducted their study where students collected vendor information for one semester to determine the amount of food that met the criteria set by the Real Food Challenge (21). A 2015 study at Indiana University Bloomington

conducted a similar assessment of food purchases to determine the percentage of sustainable food (Babb et. al, 2015; 6). Hain, et. al, utilized a year's worth of vendor purchasing information to assess the percentage of sustainable food that met the standards set by AASHE at the University of Wisconsin - Stout (2012).

Many studies exist in the literature assess environmental impacts of food procurement. M Alayna Herr collected the total food purchased (and potential origin of each item) by Indiana University for one month, and then calculated the amount of carbon emitted into the atmosphere from the amount of miles traveled ("food miles") from shipped from location to campus (Herr, 2008). Roger Motti (2009) used a list of vendors to map food purchasing for one month (10). The University of North Carolina at Chapel Hill (Campbell, et. al., 2009) performed a life cycle analysis of the carbon footprint of their dining services by investigating the purchasing, preparation, and disposal for one year at two of the largest dining halls on campus. This study multiplied one week of food purchasing invoices out to represent the entire year of purchasing, then used a Life Cycle Assessment (LCA) tool to calculate the overall impact of these purchases in terms of greenhouse gasses emitted. The authors note that a "huge gap remains where empirical food studies are concerned" (5).

This thesis project is the first assessment of food purchasing at the College of Charleston and builds off of the existing literature. Similarly to Pomona College (2009) this project utilized paper invoices to compile the food purchased by the College of Charleston for the spring 2013 semester; these paper invoices were then transferred into Excel. Vendors provided origin information for each item and further research was done, similar to many studies already completed in the field (Babb, et. al, 2015; Campbell, et.

al, 2009; Herr, 2008; Lilly, 2012; Motti, 2009; Pomona College, 2009). However, rather than track the entire varieties of food purchased by the institution, this research focuses on the procurement specifically of produce and meat. As this is the first food assessment completed for the College, the focus on single sourced items was decided to better understand the origin of our food. After this information was compiled, the total percentage of food that could be considered sustainable was calculated. Rather than using the Real Food Challenge to determine the percentage of sustainable food purchased, this paper utilized the definition established by the Association for the Advancement of Sustainability in Higher Education (AASHE). This decision was made because the College of Charleston has not yet committed to Real Food Challenge, but is a member of AASHE. The data collected from this project would also be used in the yearly Sustainability Tracking, Assessment and Rating System (STARS) required by AASHE and would be the first year the College included food tracking as part of their sustainability assessment. Both AASHE and the Real Food Challenge have comprehensive definitions of sustainability that include social and environmental certifications, well as ownership of farms, and the transportation length to campus.

To add context beyond the percentage of food defined as sustainable, this analysis used the CHarting Emissions from Food Services (CHEFS) calculator to measure the carbon impacts of food purchases. This assessment does not include the carbon impacts of disposal, only emission from the farm to the College; this was also the purpose behind using CHEFS, as this calculator compiles the total emissions from all stages (growing, production, travel) up to reaching the campus. I chose this tool for two reasons. First, rather than conduct a full life cycle assessment from farm to disposal (Cambell, et al.,

2009), I wanted to focus efforts on understanding where food was coming from, and the agricultural/slaughtering practices for produce and meat. As a great emphasis had already been made on diverting waste from the landfill at CofC--all post-consumer food thrown away in the dining halls is composted at the local center in West Ashley, South Carolina—there was a greater need to understand the impacts of food from farm to plate. Second, rather than focus only on food miles (similar to the study from Indiana University, 2008) this research hoped to include the carbon emissions from agricultural inputs and slaughtering practices, as these practices often have a greater greenhouse gas impact than food miles (Wakeland, Cholette, and Venkat, 2012; 229).

The objectives of this research paper are:

- Compile the produce and meat purchases at the College of Charleston for the spring 2013 semester.
- Research these purchases to understand the origin of food purchased for the College.
- Using this research, compile the percentage of total food purchased that can be considered "sustainable" by the definition established by the Association for the Advancement of Sustainability in Higher Education (AASHE).
- Calculate the greenhouse gas emissions of food purchases by using the CHEFS (CHarting Emissions from Food Services) Calculator.

In addition to contributing to existing literature, this project will also help to “close the gap” between consumers and their food by collaborating with Aramark Dining

Services to educate students at the College of Charleston of their food choices. Currently consumers are separated from the environmental and social impacts of the food system. Iles (2005) states that “the underlying structural causes of environmental damage in industrial agriculture are missing because they are too remote for most people, even inside the production system, to visualize or to interact with” (166). However, through institutional change campuses can begin to help educate and empower students to make better choices (Chkanikova and Mont, 2012; 14). This is especially true for higher education as this sector “generate[s] over \$19 billion in food revenue per year” (Real Food Real Jobs, 2012; 1). Additionally, colleges, businesses, and organizations play an enormous role in creating change. Park Wilde (2013) adds:

While it is true that environmental failures are pervasive in the U.S. food system, this fact does not mean that government regulations always trump market approaches. In recent years, private sector farm and food movements have far outpaced government initiatives as a source of innovation and inspiration for reconciling food production with the environment (55).

### ***Methodology***

At the time of this study, Aramark Dining Services at the College of Charleston had two main dining halls (City Bistro and Liberty Fresh Food Company), Catering, and five auxiliary locations (Chick-Fil-A, Einstein Bagels, Java City, Stern Center Food Court, and Market 159). Freshman living on campus are required to have a meal plan, but all students, faculty, and staff are able to add Dining Dollars to their account that can be used at any location. The two dining halls--City Bistro and Liberty Fresh Food Company--were chosen as the case studies for this research, as they are the two largest dining locations on campus. The purpose of this project is to research the produce and meat purchases made for the College of Charleston, track the origin of this food as close as

possible, and determine both the percentage that can be considered sustainable and the overall greenhouse gas emissions of these purchases. This was accomplished through a five-step process outlined in Figure 1:

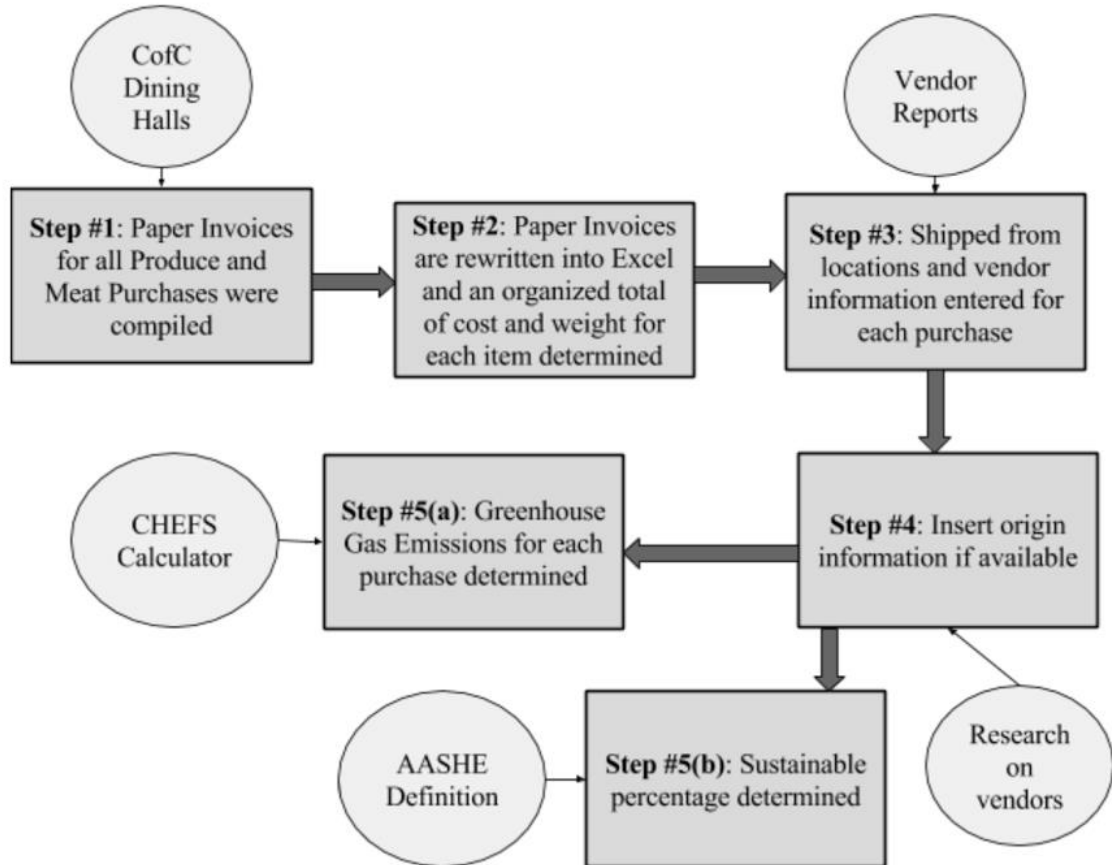


Figure 1: Graphical Representation of Methodology

In the first step, paper invoices were used as the source for the data collection at each dining hall. At the time, paper invoices were the best way to collect data because invoices were no longer available, and most orders were placed over the phone. While much more energy and time intensive, converting all paper invoices to Excel was the most holistic way to compile purchasing history. The time period of February 13th-May

7th, 2013 is used as the snapshot for the College of Charleston's food purchases. I chose these dates to overcome any potential limitations of a shorter analysis, including holiday breaks, as well as accommodate any differences in the ordering routine, and I wanted to better understand how orders were placed consistently at each dining hall. While the spring semester began January 9th--making this data collection four weeks shy of the entire semester--the overall ordering patterns remained consistent throughout the analysis, implying that this twelve week time period is still long enough to provide an accurate picture of our food procurement at the College of Charleston.

The College utilizes two main vendors for their meat and produce purchases; Sysco provides all meat and minimal produce (mostly frozen items) while locally owned distributor Limehouse Produce, of Charleston, supplies fresh produce. The College's two dining halls, City Bistro and Liberty Fresh Food Company, order from Sysco and Limehouse Produce almost daily, amounting to a total of 148 invoices from Limehouse Produce (74 invoices per dining hall) and 124 Sysco invoices (67 for Liberty Fresh Food Company and 57 from City Bistro) over the course of the twelve week time period.

Figure 2 presents an excerpt of a Sysco invoice:



20 MEAT/SEAFOOD/ENTREE (20901)								
3	SCS	105LB	M&M SHP SHRIMP PUD WHT RAW 90/110		1035575	161.29	483.87	
6	CS	110 LB	ARMOUR FRANK ALL-BEEF GRILL 8X1 5010031234		1137652	28.90	173.40	
3	CS	112 LB	J DEAN SAUSAGE LNK 1 OZ 19006		1494079	24.03	72.09	
6	CS	45 LB	TYSON CHICKEN GROUND CHUB RAW 22855-0928		1504382	31.60	189.60	
4	CS	28#AVG	ARMOUR HAM BUFFET BNLS W/A 1877 5010038688 18.780 19.140 19.220 T/WT= 77.790 20.650		1721182	2.859	222.40	
3	CS	110 LB	J DEAN SAUSAGE PORK PTY PRCKD 2 OZ 19137		2181790	20.89	62.67	
6	CS	115LB	ARMOUR BACON LAYFLAT 18/22 LOW S 5010030060		2273753	56.33	337.98	
2	CS	25 LB	FARMLND BACON BIT FINE REAL 70247172880		4551255	74.29	148.58	
5	CS	1003.2 OZ	FIRECLS BEEF PATTY GRND 75/25 HMSTYL 7701725		5829858	47.11	235.55	
5	CS	410 LB	TYSON CHICKEN CVP THIGH RNDM JMB 15248-795		8904068	63.63	318.15	
4	CS	58#AVG	SMTHFLD PORK LOIN CENTER CUT BNL 70800709267 38.600 43.700 47.740 T/WT= 179.240 49.200		9445404	2.155	386.26	
GROUP TOTAL****								2630.55
25 PRODUCE AND SALAD (20902)								
1	S	ONLY32 OZ	ITLROSE GINGER CHOPPED	CHGI632	0905539	9.17	9.17	
15	CS	65 LB	HRTYHSE POTATO FRY STR 3/8" A GRD	W77	1050715	21.72	325.80	
1	CS	122.5 LBS	SYS CLS PEA & CARROT GR A P	1263615	1263615	29.32	29.32	
1	BG	11 LB	PACKER THYME FRESH		1794841	12.80	12.80	

Figure 2: Example of Sysco Invoice (Page 1 of 16 of one order)

Paper invoices were the best way to measure purchasing at the College for a number of reasons. The first reason was that no comprehensive collection of ordering history broken down by location or by week was available at the time. It was a priority to have a breakdown by location and time period because this information would help evaluate the ability to assess whether a transition to a locally sourced item could be possible for the future. The breakdown of amount purchased and by week could then be researched alongside the growing season to determine whether Charleston growers could meet future needs. Additionally, the only way to know the amount and type of produce and meat consumed by the College was to compile the only documentation of what was ordered; in this case it was paper invoices from deliveries.

The second step of the methodology included converting the paper invoices into an electronic version. Paper invoices were typed into Excel in order to have an electronic copy of purchases. After entering the invoices, I then compiled a master list of produce and meat purchased by the College (by product), along with a total cost and weight for each item. The cost is used to calculate the percentage of sustainable food and the weight

is needed for the CHEFS calculation. Table 1 illustrates an excerpt of purchased for Liberty Fresh Food Company that were compiled from this step:

<b>Produce Type</b>	<b>Item Number</b>	<b>QTY Shipped</b>	<b>Total Purchased (\$)</b>
Pepper, Yellow	14745	26	569.76
Pineapple Golden Ripe	18830	96	1484.05
Onion Red 25#	14109	20	555.81
Onion Jumbo Yellow 50#	14036	24	566.25
Potato Idaho 100 CT	15237	47	733.98
Potato Red S 50# BG	15040	70	1168.25
Lemon CALIF 200 CT	17833	9	224.80
Tomato Grape CS MKT	16144	26	364.40
Tomato Vineripe CS	16047	80	1434.70
Orange FLA 125 CT	18641	1	14.85
Asparagus	10200	33	820.05
Jicama Case	12645	1	26.65
Tomato Plum CS (MKT)	16160	6	112.10

**Table 1: Combined Totals (Amount and Cost) for Each Item**

After completing the compiled purchases, providing context from vendors on origin was started; this is the third step of the methodology. Using the master list of total produce and meat, I then utilized two reports to supply information on the sourcing of each item. These data was provided by the vendors (Limehouse Produce and Sysco) and included the "shipped from" location. Locations provided could vary from the farm the produce was grown, to the repacker or distributor purchased from for each product. The Sysco Velocity Report provided detailed information while the information from

Limehouse Produce was not complete, sometimes listing only a location or provider.

Table 2 presents a comparison of information provided from Limehouse Produce and Sysco:

Vendor	Description	Pack/Size	Vendor Name	Ship From	Ship From City	Ship From State	Quantity Sold	Gross Sale
Sysco	Strawberry	8/1 LB	Coastal Berry	Dole Fresh Veg.	Watsonville	CA	4	\$98.38
Limehouse	Strawberry FLA	--	Nature Ripe	—	—	—	—	—

**Table 2: Comparison of Information from Vendors (Sysco and Limehouse Produce)**

Missing information (pack/size, quantity sold, and gross sale)--particularly from the Limehouse Produce Report--was calculated from the master list compiled from the paper invoices. For example, in the case of strawberries purchased from Limehouse Produce, I knew the quantity sold and gross sale amount because I calculated those totals from the paper invoices as they were entered into Excel. In most instances, it became impossible to find the exact location of origin for a product. The lack of transparency and availability of the locations and inputs (whether it be agricultural in terms of fertilizers or type of feed fed to pigs) is a characteristic of our current food system, as well as the lack of connection we have to the processes and travels prior to them reaching our plate (UMASS Dartmouth, 2010; 57).

Finally, I expanded my known data beyond the "shipped from" location in an attempt to compile not just shipping location of these items to our campus, but their place of origin, the agricultural practices used, as well as the environmental and social impacts of businesses used to procure food to the College during the spring semester when possible. This type of research aligns with the literature (Babb, 2015; Motti, 2015). As noted in a number of studies, transportation is not the only consideration when looking at

the overall impacts of our procurement choices and in fact, "'food miles' do not matter as much as other considerations when determining the carbon impact of food production, consumption, and disposal..." (Wakeland, Cholette, and Venkat, 2012; 229). For produce, this entailed researching the business vendor name, shipped from name, and location listed to understand whether this location was the origin of the food grown, and if so, what agricultural practices may be associated with this farm. Below is the previously used example with the added research on origin:

<b>Produce Type</b>	<b>Business Vendor Name</b>	<b>Ship From Name</b>	<b>Location</b>	<b>Type of Vendor</b>
Pepper, Yellow	C&R FRESH, LLC	C&R FRESH, LLC	NOGALES, AZ	Distributor
Pineapple Golden Ripe	THE OPPENHEIMER GROUP	THE OPPENHEIMER GROUP	PORT LIMON, CR	Distributor
Onion Red 25#	BAKER PACKING CO.	BAKER PACKING CO.	ONTARIO, OR	Possibly Grown/Dist.
Onion Jumbo Yellow 50#	BAKER PACKING CO.	BAKER PACKING CO.	ONTARIO, OR	Possibly Grown/Dist.
Potato Idaho 100 CT	MCNEIL	MCNEIL	IDAHO FALLS, ID	Origin/Processing/Dist.
Potato Red S 50# BG	MACK FARMS	MACK FARMS	LAKE WALES, GA	Origin/Processing/Dist.
Lemon CALIF 200 CT	SUNKIST GROWERS, INC.	SUNKIST GROWERS, INC.	ARVIN, CA	Origin/Processing/Dist.
Tomato Grape CS MKT	FELDA TOMATO GROWERS, INC.	FELDA TOMATO GROWERS, INC.	IMMOKALEE, FL	Possibly Grown/Dist.
Tomato Vineripe CS	FELDA TOMATO GROWERS, INC.	FELDA TOMATO GROWERS, INC.	IMMOKALEE, FL	Possibly Grown/Dist.
Orange FLA 125 CT	DNE WORLD FRUIT SALES	DNE WORLD FRUIT SALES	FORT PIERCE, FL	Possibly Grown/Dist.

Asparagus	HARVEST SENSATIONS	HARVEST SENSATIONS	CALLAO, PE	Distributor
Jicama Case	SEASHORE FRUIT & PRODUCE CO.	SEASHORE FRUIT & PRODUCE CO.	ATLANTIC CITY, NJ	Wholesale Distributor
Tomato Plum CS (MKT)	FELDA TOMATO GROWERS, INC.	FELDA TOMATO GROWERS, INC.	IMMOKALEE, FL	Possibly Grown/Dist.

**Table 3: Location and Origin Information (If Available) per Item**

Using data provided by the Sysco Velocity Report, I cross-referenced the shipped by business name and location with the FSIS Meat, Poultry and Egg Product Inspection Directory to better understand the information given by Sysco. The FSIS Report (developed by the USDA) breaks down inspected locations by slaughter, processing, import, or warehouse (likely being held before shipped to the purchaser). Published in 2015, this report provided more information on the location given by Sysco.

In addition to the information provided by the FSIS Report, I also used a great deal of ground-truthing to help determine the stage of the food system for the "shipped from" location provided. Ground-truthing is "on the ground verification" and I attempted to develop the most comprehensive picture possible for the given location (Liese, et. al., 2010; 1324). This included thoroughly researching vendors, as well as their agricultural and social practices, telephone calls, and using Google Maps. I called multiple vendors the College purchased from, in some instances was able to find shipping information of ports used by international companies, as well as using "street view" in Google Maps. This application helped determine the stage of the food system for a given location due to viably seeing the operation.

With the final data of total amount purchased and origin compiled, I was able to now use this information for the both CHEFS (to calculate the greenhouse gas emissions

of these purchases) and AASHE (assess the amount of purchases that are sustainable). The final portion of this Methodology includes an overview of the qualifications for CHEFS and AASHE. The results of both assessments follow in the next section.

Our current food system is one of the main sources for global greenhouse gas emissions; I chose the CHEFS tool to calculate the contribution of emissions from the College of Charleston's food sourcing. In 2007 the Intergovernmental Panel on Climate Change (IPCC) found that 31% of all anthropogenic greenhouse gas (GHG) emissions were caused by agriculture and deforestation (Kim and Neff, 2009; 186). Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), and Nitrous Oxide (N<sub>2</sub>O) are the most significant emissions from the agricultural sector (Smith, et al., 2008; 789). Agriculture alone “accounts for 67 percent of all nitrous oxide emissions in the United States” (Hesterman, 2012; 29).

Endorsed by AASHE, the CHEFS (CHARTing Emissions from Food Services) calculator determines the carbon impact of meat and produce through compiled Life Cycle Assessment (LCA) analyses. This calculator was chosen due to the College of Charleston's membership to AASHE and the organization's recommendation to utilize the tool in determining campus dining emissions. The tool, created by Clean Air-Cool Planet, was presented at the 2011 AASHE National Conference with the purpose:

to help institutions estimate emissions from the entire life cycle of food they serve, from farm to campus. CHEFS is unique in that it is focused on North American data sources and aims to provide a comprehensive and customizable data points while remaining simple enough for users without life cycle assessment experience (Clean Air-Cool Planet, 2012; 1).

To develop a carbon snapshot of the purchases made, "you only need to know the product name (i.e. tomatoes), the amount purchased in pounds... and the distance from distribution warehouse to campus..." (Clean Air-Cool Planet, 2012; 1).

CHEFS only requires the distance from the shipping location to the institution to be entered into the calculator. However, in order to be as comprehensive as possible, I included the total travel miles from origin to institution--when available--for each item's CHEFS input. This distance is known as food miles; "food miles" is a term for the number of miles produce or meat has traveled from the farm to gate to plate (Cleveland, Carruth, and Mazaroli, 2015; 282; Passel, 2013; 3). In the United States food travels an average of 1500 miles before consumption (Schnell, 2013; 615). The transportation of food from origin to our plates contributes to atmospheric pollution; transportation accounts for 11%-16% of the food system's total greenhouse gas emissions (Wakeland, Cholette, and Venkat, 2012; 225). While food miles can be an important first step to analyzing the food system, it is important to note that this number does not include the type of food (meat for example is much more energy intensive), agricultural inputs or other externalities beyond CO2 emissions.

Once the total and origin for each produce and meat product was determined, I then used the Association for the Advancement of Sustainability in Higher Education (AASHE) definition of sustainable food to calculate the percentage that could be considered sustainable. As stated previously, the College of Charleston is a member of AASHE and completes assessments of sustainability efforts as defined by the organization; calculating the percentage of food considered sustainable is one area of these assessments. According to AASHE, in order to be considered a "sustainable" food purchase, the item must fall under one of two (or both) requirements: humane, fair, or ecologically sound verified by a third party and/or local/community based (AASHE, 2013; 142). To be considered local or community based, products must be from a

producer (farmer, rancher, business) that is "based or originating within 250 miles (400 kilometers) of the institution (regardless of road mileage or terrain, i.e. 'as the crow flies')" (AASHE, 2013; 330). Additionally, any products procured from Concentrated Animal Feeding Operations (CAFOs) are disqualified (AASHE, 2013; 142). Table 4 shows the AASHE qualifications for sustainable produce and includes examples to illustrate the definition:

<b>Food Type: Produce</b>	<b>Definition of a Sustainable Purchase</b>	<b>Example of Sustainable Purchase</b>
<b>Qualification #1:</b>	Originated from within 250 miles from the institution AND from a community-based vendor	Strawberries purchased from locally owned Ambrose Farm in Wadmalaw Island, SC
<b>Qualification #2:</b>	Humane, Fair, or Ecologically Sound verified by a third party vendor regardless of distance	Strawberries from Naturipe Produce that are certified Organic from Salinas, CA

**Table 4: Qualifications for Sustainable Food (Produce)**

Table 2 shows the AASHE requirements and disqualification for sustainable meat, including examples:

<b>Food Type: Meat</b>	<b>Definition of a Sustainable Purchase</b>	<b>Example of Sustainable Purchase</b>
<b>Qualification #1:</b>	Originated from within 250 miles from the institution AND from a community-based vendor	Pork purchased from small scale operation Legare Farms on John's Island, SC
<b>Qualification #2:</b>	Humane, Fair, or Ecologically Sound verified by a third party vendor regardless of distance	Pork purchased from White Oak Pastures in Bluffton, GA that is Humane certified
<b>Disqualification:</b>	Product was processed in a Concentrated Animal Feeding Operation (CAFO) regardless of distance	Chicken purchased from Butterball Turkey from Mt. Olive, NC

**Table 5: Qualifications for Sustainable Food (Meat)**



The first sustainable qualification for both produce and meat includes the distance the food traveled in relation of the College of Charleston. AASHE defines local as originating from within 250 miles ("as the crow flies") from the institution. Figure 3 presents the 250 mile radius of the College and the area that qualifies as local:

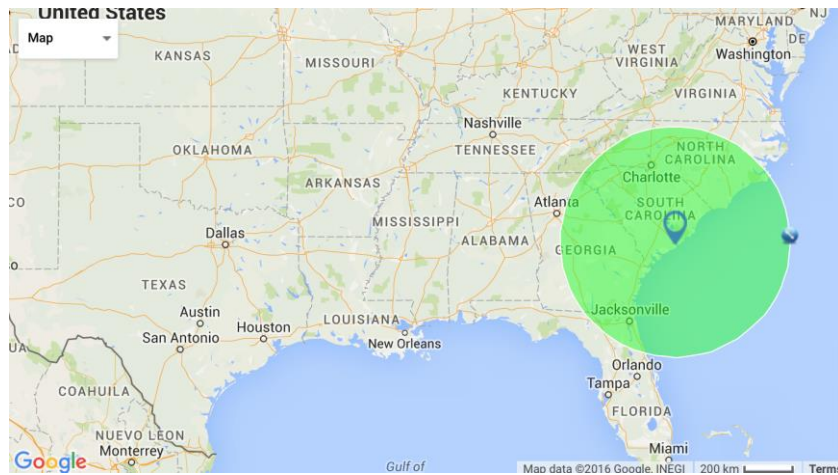


Figure 3: 250 Mile Radius of the College of Charleston

## ***Results***

As outlined in the Methodology chapter, the compiling of purchasing data and origin research was required for the two outcomes of this study of food procurement at the College of Charleston. The first result includes an overview of using the CHEFS tool to determine greenhouse gas emissions of these purchases. Second, the percentage of sustainable food as defined by AASHE is presented.

First, while the purpose of CHEFS was to calculate emissions from food, the results of this assessment proved the tool determined no relevant or accurate outputs. CHEFS promotes the ability to include agricultural inputs and production methods into the greenhouse gas calculations, but this proved not to be an accurate claim. For example, in many instances the tool does allow agricultural changes from the default "conventional" option to Organic or Integrated Pest Management (IPM). However, in most examples--particularly produce--this option is either not available or does not change the overall carbon output determined by CHEFS; a portion of the analysis that should greatly affect the carbon output number created by the calculator. Inputs such as fertilizers and pesticides are energy intensive and environmentally harmful because as "nitrogen fertilizer is applied to fields, much of the ammonia eventually degrades and is converted into nitrous oxide (N<sub>2</sub>O), a greenhouse gas 300 times as potent as CO<sub>2</sub> that escapes into the atmosphere. Globally, N<sub>2</sub>O is responsible for approximately 6.3% of anthropogenic climate change" (Kling and Hough, 2010; 8).

While this tool has been stated as a comprehensive calculator, by merely determining a carbon footprint based off of transportation alone, and by only requiring the mileage from distribution to institution, it is omitting not only the potential overall food miles of a product, but the impacts of the agricultural inputs that in many examples have the most detrimental environmental and social effects; a 2008 life cycle assessment of food by households in the United States found that "delivery only accounts for 4% of total GHG emissions, and transportation as a whole accounts for 11%. Additionally, the wholesaling and retailing of food account for another 5%, with production of food accounting for the vast majority (83%) of total emissions" (Weber and Matthews, 2008;

3511). Therefore, the results of the CHEFS tool were inconclusive as an overall calculation of greenhouse gas emissions from the College's food purchases.

The next portion of this results chapter includes the percentage of produce and meat considered sustainable by AASHE standards.

*Produce*

During the spring semester, \$101,889.98 was spent on produce for the College of Charleston. Of this amount it was determined that less than 1% (\$911.74) could be considered a sustainable purchase. Table 6 reviews the AASHE qualifications for sustainable produce:

<b>Food Type: Produce</b>	<b>Definition of a Sustainable Purchase</b>	<b>Example of Sustainable Purchase</b>
<b>Qualification #1:</b>	Originated from within 250 miles from the institution AND from a community-based vendor	Strawberries purchased from locally owned farm Ambrose Farm in Wadmalaw Island, SC
<b>Qualification #2:</b>	Humane, Fair, or Ecologically Sound verified by a third party vendor regardless of distance	Strawberries from Naturipe Produce that are certified Organic from Salinas, CA

**Table 6: Qualifications for Sustainable Food (Produce)**

Of the purchases made by the College of Charleston, the produce that can be considered sustainable includes food originating from within 250 miles of the College (\$885.55) as well one purchase that includes a sustainable certification (\$26.19). Table 7 presents the purchases that qualify as sustainable by AASHE standards for the College of Charleston's spring 2013 semester:

<b>Name</b>	<b>Location</b>	<b>Product</b>	<b>Qualification</b>	<b>Total \$</b>
Mepkin Abbey	Moncks Corner, SC	Shiitake Mushrooms	Originated from within 250 miles from the institution AND from a community-based vendor	168.00
Solar Farms, Inc.	Columbia, SC	Sprouts Mung Beans	Originated from within 250 miles from the institution AND from a community-based vendor	45.40 99.00
Mac's Pride	McBee, SC	Strawberries	Originated from within 250 miles from the institution AND from a community-based vendor	219.60
Burch Farms	Faison, NC	Cabbage Sweet Potatoes	Originated from within 250 miles from the institution AND from a community-based vendor	339.15 14.40
Taylor Farms	Salinas, CA	Carrots	Humane, Fair, or Ecologically Sound verified by a third party vendor regardless of distance	26.19

**Table 7: Produce Qualified as Sustainable**

While it is important to determine the percentage of produce that can be considered sustainable, it is also imperative to understand why many purchases did not qualify. The bulk of this research aimed to verify whether purchases could be considered sustainable; this required thoroughly researching all food listed within 250 miles of the institution to determine their origin. Figure 5 shows produce purchases shipped from within 250 miles of the College of Charleston:

Item Name	Shipped From	Miles	Business Vendor Name	Ship From Name	Origin	Sustainable?	QTY LBS	Total Cost (\$)
Mushroom, Shiitake	MONCKS CORNER, SC	29	MEPKIN ABBEY	MEPKIN ABBEY	Y	Y	24	168
Tomato, 5x6	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	25	22.35
Tomato, 6x6	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	1900	1449.6
Tomato, Grape	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	1540	2443.85
Tomato, Green	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	75	53.75
Tomato, Plum	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	125	90.25
Tomato, Vineripe	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	175	103.95
Tomato, Yellow	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	25	29.35
Pea, Blackeye	EFFINGHAM, SC	89	MCCALL FARMS INC.	MCCALL FARMS INC.	P	P	40	43.04
Collards, Chop	PELION, SC	102	WALTER P RAWLS & SONS	WALTER P RAWLS & SONS	P	P	72	95.1
Collards, Green Chop	PELION, SC	102	WALTER P RAWLS & SONS	WALTER P RAWLS & SONS	P	P	156	228.65
Lemon, Minipak	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	35	58
Lime	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	10	17.05
Potato, Red	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	20	18.75
Radish, Red Cello	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	1,125	3.48
Sprout, Alfalfa	WEST COLUMBIA, SC	106	SOLAR FARMS, INC	SOLAR FARMS, INC	Y	Y	120	45.4
Sprout, Mung Bean	WEST COLUMBIA, SC	106	SOLAR FARMS, INC	SOLAR FARMS, INC	Y	Y	75	99
Squash, Butternut	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	6	44.6
Strawberry	MCBEE, SC	118	MAC'S PRIDE	MAC'S PRIDE	Y	Y	600	219.6
Cabbage, Green	FAISON, NC	191	BURCH FARMS	BURCH FARMS	Y	Y	760	339.15
Potato, Sweet #1	FAISON, NC	191	BURCH FARMS	BURCH FARMS	Y	Y	40	14.4
Potato, Sweet Jumbo	SNOW HILL, NC	225	HAM PRODUCE CO INC	HAM PRODUCE CO INC	P	P	3800	1699.1
Carrot, Cello	FOREST PARK, GA	236	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	P	P	385	96
Squash, Butternut	LAKE PARK, GA	236	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	210	191.5
Cucumber	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	375	538.53
Eggplant, Whole	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	3	6.76
Eggplant, Whole	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	24	21.42
Pepper, Green	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	1500	1047
Zucchini, #2	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	10	7.62

Figure 4: Produce Purchases Within 250 Miles of the Institution (Y=Yes, P=Probable, N=No)

Of the total produce purchased by the College, \$9195.25 (11%) *could* be considered sustainable food due to its locality and originating from a community-based vendor. However, only 10% of the total purchases (\$885.55) could be verified as a sustainable purchase from a community based grower within 250 miles of the institution. Of the rest of the purchases shipped from 250 miles of the College, 66% (\$6101.93) was purchased from a repacker and therefore could not be verified further, and 24%

(\$2207.77) shipped from farms with multiple growing locations, again making the origin undetermined.

As with case studies discussed in the literature, origin must be verified to understand whether the purchase meets the requirements of AASHE to be considered sustainable. However, there are a number of purchases that potentially could meet the qualifications, but the origin data are not 100% verifiable, due to a number of factors. This includes the fact that many growers have multiple farms with locations outside of the radius determined by AASHE as well as many purchases were made from other distributors/repackers. The following tables present the purchases shipped from within 250 miles but did not meet the requirements of AASHE to be considered sustainable. Table 8 shows purchases made from growers that have farms both inside and outside of the 250 mile radius of the College of Charleston. As a result of multiple growing locations, the origins of these purchases were not verifiable:

<b>Name, Location, Product</b>	<b>Issues with Sourcing Information</b>
<p>Ham Produce Co., Inc. Snow Hill, NC</p> <p>Sweet Potatoes</p>	<p>"Today Ham Farms, Inc. grows approximately 8,500 acres of sweet potatoes, onions, and cabbage in three states, placing them among the top 25 growers in the Southeast (FreshPoint, 2015).</p>
<p>McCall Farms, Inc. Effinham, SC</p> <p>Black Eye Peas</p>	<p>"All of our products and ingredients are grown here in the United States. We are committed to working with local farms as much as possible. As a result, 80% of our produce comes from farms located within 150 miles our canning facility. The remaining 20% comes from other reputable growers throughout the United States (Margaret Holmes Website).</p>
<p>V.B. Hook &amp; Co. West Columbia, SC</p>	<p>"Because we have longstanding good relationships with growers in Florida and other warm US climate regions, we are able</p>

Lemons, Limes, Potatoes, Radishes, Butternut Squash	to bring our customers fresh, high quality produce year-round (V.B. Hook & Company Website)
Walter P. Rawl & Sons Pelion, SC  Collards	"Its operations were expanded to Florida , with grower-partners in Colorado, Mississippi, New York, Texas, Virginia, and Wisconsin" (DeMartino, 2015; 1)

**Table 8: Farms with Growing Areas Both Inside and Beyond Radius (Origin not Verifiable)**

In addition to multiple growing areas, the origin of purchases made from repackers or other distributors could not be verified, therefore, not enough information to determine whether the item qualified as sustainable. Table 9 shows the purchases made from repackers and distributors within the 250 mile radius of the College:

<b>Name</b>	<b>Location</b>	<b>Product</b>
Williams Farms Repackers	Lodge, SC	Tomatoes
FreshPoint Repackers of Atlanta	Forest Park, GA	Carrots
Coggins Produce, Inc.	Lake Park, GA	Squash, Eggplant, Cucumber, Zucchini, Pepper

**Table 9: Produce Purchased from Vendors Inside Radius that are Distributors/Repackers (Origin not Verifiable)**

### *Meat*

Of all the sectors of the agricultural industry, meat is the largest contributor to greenhouse gas emissions (Lowe and Gereffi, 2009; 48). In 2006, the Food and Agriculture Organization (FAO) found that 18%--nearly one fifth--of all human-induced greenhouse gas emissions stemmed from animal agriculture alone, more than even the total transportation sector (Koneswaran and Nierenberg, 2008; 578). Methane is also emitted from “enteric fermentation in ruminant animals (cattle, sheep, goats) and manure management” (Weber and Matthews, 2008; 3511). In addition to the gases emitted, the beef and lamb industry in particular also contribute to climate change through the elimination of carbon sinks: “Example calculations for several livestock products show

that the CO<sub>2</sub> consequences of land occupation can be the same order of magnitude as other processes related to greenhouse gas emissions of the LCA [life cycle assessment]” (Schmidinger and Stehfest, 2012; 962). The industrialized food system, particularly factory farming and monoculture agriculture, have been found to cause health issues stemming from pesticide runoff into streams and soil, air quality concerns near residential areas, and growing resistance to antibiotics in humans. For example, “seventy percent of US-produced antibiotics are fed to animals to promote growth. Excessive use of such drugs in animals can enhance the development of drug-resistant strains of disease” (Horrigan, Lawrence, and Waler, 2002; 451).

Designed to increase efficiency with little emphasis given to the humane treatment of animals, workers, the environment, or those living near the area in which they are located, Concentrated Animal Feeding Operations (CAFOs) are excluded as sustainable purchases. These facilities “make up only 5% of all livestock farms in the US, but raise approximately 54% of the nation’s livestock” (Mitloehner and Calvo, 2008; 163). AASHE disqualifies any meat purchase from a CAFO, regardless of its proximity to the institution. Table 11 outlines the qualifications to be considered a sustainable meat purchase; it is important to note that if this product derived from a CAFO it is disqualified from consideration:



<b>Food Type: Meat</b>	<b>Definition of a Sustainable Purchase</b>	<b>Example of Sustainable Purchase</b>
<b>Qualification #1:</b>	Originated from within 250 miles from the institution AND from a community-based vendor	Pork purchased from small scale operation Legare Farms on John's Island, SC
<b>Qualification #2:</b>	Humane, Fair, or Ecologically Sound verified by a third party vendor regardless of distance	Pork purchased from White Oak Pastures in Bluffton, GA that is Humane certified
<b>Disqualification:</b>	Product was processed in a Concentrated Animal Feeding Operation (CAFO) regardless of distance	Chicken purchased from Butterball Turkey from Mt. Olive, NC

Table 10: Sustainable Qualifications for Meat

Interestingly, nearly 20% of meat purchased by the College shipped from within 250 miles of the institution, from a few of the largest meat industries in the world.

However, because all of these locations are CAFOs and no purchases were made from a third party sustainably certified operation (for example, Certified Humane) zero percent of the meat purchases made during the spring 2013 semester qualify as sustainable.

Again, this is not atypical of any institution or restaurant purchasing meat, but a reflection of the current industrialized meat system. Figure 6 represents all meat purchased within 250 miles of the College of Charleston:

Item Name	Shipped From	Miles	Business Vendor Name	Ship From Name	Slaughter, Processing	Sustainable?	QTY LB	Total QTY	Total Cost (\$)
Pork, Chop	MT PLEASANT, SC	9	SPECIALTY FOOD SOLUTIONS, INC	SPECIALTY FOOD SOLUTIONS, INC	Closed	N	10	140	379.54
Chicken, BRD Popcorn	BATESBURG, SC	132	AMICK FARMS	AMICK FARMS	Slaughter, Processing	N	10	2160	2782.08
Chicken, CVP Wing JMBO	BATESBURG, SC	132	AMICK FARMS	AMICK FARMS	Slaughter, Processing	N	40	160	78.15
Pork, Loin Center	TAR HEEL, NC	150	SMITHFIELD FOODSERVICE GROUP	SMITHFIELD FOODSERVICE	Slaughter, Processing	N	57	2447.69	4135.62
Pork, Boston Butt	TAR HEEL, NC	150	SMITHFIELD FOODSERVICE GROUP	SMITHFIELD FOODSERVICE	Slaughter, Processing	N	57	1232.1	1484.84
Turkey, Smoked	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	15	996.54	3660.08
Turkey, Ground FRZ	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	20	360	438.12
Turkey, Breast O/R	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	20	2121.6	6182.12
Turkey, Patty Frozen	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	8	160	438.05
Turkey, Burger Pepper	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	13	359.78	877.95
Turkey, Bacon Layflat	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	12	12	33.23
Turkey, BRST Raw	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	20	501.38	1543.61
Turkey, Meat Pulled	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	10	60	38.97
Sausage, Patty Raw	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	12	288	859.68
Sausage, Link	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	12	229	456.57
Sausage, Pork Patty	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	10	680	1420.63
Sausage, Rope Kielbasa	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	11	198	808.58
Turkey, Sausage Link	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	12	288	734.88
Ham, Steak	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	12.5	75	350.27
Sausage, Italian Link	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	12	480	1312.4
Pork, Sausage Patty	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	12	396	956.01
Pork, Chop	CLAYTON, NC	216	SMITHFIELD FOODSERVICE GROUP	SMITHFIELD FOODSERVICE	Warehouse	N	10	90	285.48

Figure 5: Meat Purchases From Within 250 Miles of the Institution

As 20% of the meat purchased for the College came from within 250 miles of the institution, more information on these vendors (and their practices) was needed in order to determine whether the purchase qualified as sustainable. The vendors located in this radius are listed in table 12 (excluding the Mt. Pleasant, SC purchase as Specialty Food Solutions, Inc. in which no information could be found):

Name, Location, Product	Vendor Information
<p style="text-align: center;">Amick Farms Batesburg, SC Chicken</p>	<p style="text-align: center;">Vertically integrated, Amick Farms was purchased by OSI Group in 2006, and is "now part of the 11th largest meat manufacturing company in the world" (Amick Farms Website; 2012). The Batesburg location was fined \$12,000 in 2010 and \$1,000 in 2011 by the South Carolina Department of Health and Environmental Control for pollution violations (South Carolina Department of Health and Environmental Control 2010; 2011)</p>
<p style="text-align: center;">Carolina Turkey Mount Olive, NC Turkey</p>	<p>A 2006 acquisition of Butterball Turkey from ConAgra Foods made Carolina Turkey the "largest turkey producer in the United States" (Triangle Business Journal, 2006; 1). Sara Lee Bakery: Sara Lee Bakery renamed its North American operations Hillshire Farms and in 2014, Hillshire was purchased by Tyson Foods, making the combination of companies worth \$40 billion (Tyson Foods Inc., 2014).</p>
<p style="text-align: center;">Sara Lee Bakery Macon, GA Pork, Turkey</p>	<p>Sara Lee Bakery: Sara Lee Bakery renamed its North American operations Hillshire Farms and in 2014, Hillshire was purchased by Tyson Foods, making the combination of companies worth \$40 billion (Tyson Foods Inc., 2014).</p>
<p style="text-align: center;">Smithfield FoodService Clayton, NC Pork</p>	<p>Smithfield Foodservice: Smithfield is the largest producer of pork in the world and the Tar Heel, North Carolina plant is the largest operation. According to a 2006 report, this location "dumps more toxic waste into the nation's water each year than all but three other industrial facilities in America" (Tietz, 2006; par. 17).</p>

**Table 11: Information on Meat Vendors Inside Radius**

Therefore, the results of my assessment show that less than 1% of the produce and meat purchased for the College of Charleston during this twelve week time period could be considered sustainable. While this number is low, it is important to note that at the time of the study, no emphasis had yet been placed on tracking the origin of our food or purchasing locally. Table 13 overviews the percentage of the food qualified as sustainable and the reason this number is not higher:

Type of Purchase	Total Purchased	Amount Qualified as Sustainable	Reason
Produce	\$101,889.98	0.87% (\$911.74)	Not all produce origins are verifiable due to the current food system.
Meat	\$128,695.91	0%	All meat purchases are disqualified because they originate from CAFO

Table 12: Overview of Sustainable Percentage of Food

### *Discussion*

Our current food system is complicated. As noted by Opel, et. al (2010, 253), "what we mean when we say 'food' reveals a complex set of land use and labor practices, corporate structures, public policy, plant and animal genetics, and human health impacts." Others have defined the food system as "a network of people, processes, and technologies that work together to provide the food we eat. It often includes the farmer, processing plant, delivery truck, sales clerk, consumer, and others in between" (Baranski, Babbie, and Pirog 2012; 1). In order to gather a holistic perspective of the processes and key players involved in how food is procured and sold in the United States, Ericksen (2007) recommends the definition to also include the following components: interactions between the human and biophysical environments, the activities and their outcomes from production to consumption, and aspects of food security (1-2).

The food system has become increasingly concentrated, mechanized, and energy intensive, which has negatively impacted both human and natural environments (Ericksen, 2007; 2, Hamm, 2008; 170, Kennedy, 2003; 1, Lyson, 2007; 21, Patel, 2007; 112, Pretty, 2008; 448, Sexton, 2000; 1092, Wilde 2013; 94). With such a complex web

of growers, distributors, service providers, and consumers, it is difficult to understand not only how food is grown, but also how it travels throughout the system before consumption. Currently, little emphasis is placed on both traceability and availability of this information to understand the impacts of food purchasing. The gaps within the system make determining complete and accurate sustainable percentages of total purchasing nearly impossible.

One of the first results of this research is the lack of transparent and usable information on where food originates; this result aligns similarly with the literature: Roger Motti (2009) states in his assessment of food sourcing at California State University Northridge: "Where does our food come from? None comes directly from [the] source" (21), and a similar result is noted by studies conducted at the University of Maryland (Lilly, 2012; 21) and the University of Wisconsin - Stout (Hain, et. al, 2012; 4). Issues with food system transparency are illustrated below with the following examples:

#### Example #1: Tomatoes

California and Florida are the largest producers of tomatoes in the United States. During the winter, Florida is the only producer of tomatoes with the largest production months being from November to January and April to May (United States Department of Agriculture, "Tomatoes", 2012; par. 3). According to the USDA, repackers typically sell tomatoes. These vendors purchase tomatoes from multiple farms and hold the produce until they are ready to ship. Therefore, a box of tomatoes from a repacker could contain produce from multiple origins, making uncovering their origin nearly impossible. According to a report by Golan, et al., (2004) published by the United States Department

of Agriculture, repackers can create issues with traceability: “Frequently, tomatoes are sold and shipped from their production regions to repackers or wholesalers who ripen, resort, and repackage for uniform color and then sell to local retailers and foodservice buyers. On any day repackers may use tomatoes from several different sources to create a new box of tomatoes (20).

Tomatoes require a warm climate to grow; in the early months of the year it is safe to assume that tomatoes purchased by the College of Charleston are sourced from Florida. Aramark Dining Services spent \$4,4163.75 was on tomatoes from Williams Farms Repackers, located in Lodge, South Carolina (62 miles from the College of Charleston). This does not mean that tomatoes were grown at this location--this time period is not typical of the tomato-growing season in South Carolina--but this was the only location provided by Limehouse Produce.

#### Example #2: Pineapples

Not locally grown in South Carolina, it is obvious that pineapples are not from the state. However, it is important to note that the fruit does not always travel a direct route to the College from Port Limon, Costa Rica. While the vendor does utilize ports in the same general path to South Carolina (Miami, for example), there is no validated information stating that they in fact came into the United States through a particular port. A phone call to the Oppenheimer Group's (the vendor of the College's pineapples) New Jersey office confirmed the lack of transparent routes that produce travels. The representative stated that as one of the vendor's most popular points of entry, the pineapples may have traveled up from Costa Rica, to New Jersey, then traveled back

down the coast to Charleston, SC. There is no viable way to list each step of the fruit's stages in the food system.

#### Example #3: Strawberries

Many large companies actually have growing locations across not only the United States, but internationally as well to provide produce year-round to consumers. It is important to understand the various growing seasons in assessing information about purchases made and strawberries provide an interesting example of this. Limehouse Produce uses multiple to supply strawberries to the College of Charleston in the spring of 2013. While Limehouse Produce provided Nature Ripe as the vendor for many of the College's strawberry purchases, as a company, Nature Ripe has growing locations in California, Florida, Mexico, and Chile. It is impossible to know where the strawberries for the College were grown (and how) based off of the available information; in the spring months strawberries can grow in California, Florida, and Mexico.

#### Example #4: Beef

Beef in particular can be difficult to track from birth to slaughter to plate. At a large scale, and certainly the institutional level, various stages of the process are simply unknown including type of diet, how and where the animal was slaughtered, and whether the animal was a dairy cow. Typically calves are kept on traditional farms until 10 months of age and then are given to stocker operators until 14 months of age where they weigh 600-800 pounds. Following stocker operations, the cows are then sent to feedlots where they are brought to "slaughter weight" of 900-1,400 pounds (age 12-22 month) and then slaughtered and packed (Lowe and Gereffi, 2009; 13). Cows can travel across the

United States; calves are born across the US, with commercial feedlots in Texas, Nebraska, Kansas, and Texas, where a majority of cattle are also slaughtered (Lowe and Gereffi, 2009; 11, Golan, et. al., 2004; 29).

Understanding at which stage of the process the "shipped from" location provided from the vendor can be difficult. In comparing the information provided by Sysco to the FSIS report, I was able to determine more information on the location's stage of the food system. Lowe and Gereffi (2009) note the difficulty in acquiring transparent data and note a good indicator of the type of beef purchased is by location; slaughtering plants in the midwest typically source from dairy farms (21). As there is no centralized slaughtering house in the Charleston area; local cows have to be shipped out of state to be slaughtered. They are then shipped back into South Carolina to be sold as a meat product. This transportation is also not reflected in the "shipped from" miles, when (for example) John's Island is listed as the "shipped from" location.

This system is similar to other meat products including pork and poultry, although these industries are more vertically integrated, a "processing and distribution system where the physical production of birds is handled almost entirely by contract growers" (Vukina, 2001; 29). Due to vertical integration, poultry and pork companies are able to control the type of animal born, the food and antibiotics given, as well as how they are slaughtered. According to the United States Department of Agriculture, all broiler chickens (the type of chicken typically used) are usually produced under contract between growers and processors and in the pork industry, hogs sold through contractual agreements has risen from 10 to 72 percent from 1993-2001 (Martinez, 2002; 1). The meat industry has also become more concentrated with large meat industries growing



their dominance of particular sectors. Table14 shows the concentration of companies (and therefore the control of animal type produced, feed and antibiotics given, and slaughtering standards) in the meat slaughtering industry:

<b>Type of Meat Slaughtered</b>	<b>Names of Companies</b>	<b>Percentage Owned</b>
Beef	Cargill, Tyson, JBS, National Beef	82%
Pork	Smithfield Foods, Tyson Foods, Swift (JBS) Excel Corps (Cargill)	63%
Broiler (Chicken)	Tyson, JBS (Pilgrim's Pride), Perdue and Sanderson	53%
Turkey	Butterball (Smithfield/Goldsboro), Jennie-O (Hormel), Cargill, and Farbest Food	58%

Table 13: Concentration of the Slaughtering Industry (Hendrikson, 2014; 3)

Many other negative impacts of the food system are difficult, if not impossible to measure at an institutional level from individual food sourcing research. Our current agricultural system in the United States utilizes 70% of the freshwater supply and food waste alone “accounts for 300 million barrels of oil per year representing 4% of total US oil consumption in 2003” (Hall, et al., 2010; 1). Energy use in farming has been steadily increasing and rose 13% from 2002 to 2007 (Wilde, 2013; 47); the average farm in the United States requires three kcal of fossil fuel energy in order to develop one kcal of food energy and in feedlots this ratio increases to 35:1 (Horrigan, Lawrence, and Walker, 2001; 446). A 1996 Danish study found that for a family of four “one third of the family’s total environmental impact was found to be related to the food system” (Andersson, 2000; 239).

Environmental injustices from the current food system are also difficult to assess at an institutional level. As 20% of our total meat purchases come from within 250 miles of the College of Charleston, this is a very relevant social sustainability issue to CofC. Particularly for the state of North Carolina (one of the top two states for hog production) where CAFOs now operate on land once occupied by plantation owners, the environmental and health effects of these operations on mostly poor, African American communities raises concerns of environmental injustice: As one pair of investigators explained, “[P]eople of color and the poor living in rural communities lacking the political capacity to resist are said to shoulder the adverse socio-economic, environmental, or health related effects of swine waste externalities without sharing in the economic benefits brought by industrialized pork production” (Wendee, 2013; 183). Using data from a Missouri study, a 2005 estimate found that a total loss of property value from CAFO expansion in the United States to be near \$26.5 billion (Gurian-Sherman, 2005; 63). A 2011 study found that 25-40% of CAFO workers suffered from respiratory diseases (as did residents living near operations) as well as other workplace issues including hearing loss, death from interaction with animals, and other distresses (Kolbe, 2013; 427). Pathogens from these operations are easily spread by air and water to nearby communities. Pathogenic resistance is an additional concern for populations living near CAFOs (Gurian-Sherman, 2005; 60).

The scholarship on food systems is also beginning to recognize the many social implications of how we currently grow and consume food in the United States. Policies and sustainability initiatives often focus on growers, crop applications, or creating “local” food systems, but without much recognition of the social injustices faced by those

working the fields; this raises questions about how our increasingly cheap and industrialized food system is impacting farmworker health and social justice. As stated by one scholar, "Relegating farmworkers to invisible roles foregoes opportunities to improve food systems and systematically repeats the cycle of harm that farmworkers and other agricultural laborers endure" (Luna, 2014; 267).

It is estimated that three million migrant farm workers are employed in the United States, mostly in California, Texas, and the midwest; a majority of these workers and their families are from Mexico and Latin America (Bail, et. al, 2012; 1). Seasonal farmworkers live in close and substandard living conditions, with limited access to health care, paid leave, sick leave, speak little English, and are paid by piece-rate, often working long hours in very hot conditions (Allen, 2008; 157, Kelly, Glick, and Kulbok, 2012; 215, Luna, 2014; 280). For example, a study of farmworker health in Georgia found that these workers have very limited access to healthcare, and they suffer workplace injuries and abuse: "While farmworkers provide the manual labor required to produce the fruits and vegetables Americans see every day in the supermarket, they are largely both figuratively and literally invisible" (Bail, et. al., 2010; 3). Farmworkers and their families have higher risks of developing respiratory issues such as asthma as exposure to pesticides in fields can be brought home (Schwartz, et. al, 2015; 85). Some who work in the fields have recently been discovered to be enrolled in involuntary servitude, such as in Florida, where the most recent case was tried in 2008; "Many of the cases led to sentences of twelve or fifteen years in federal prison" (Cano, 2014; 52).

## *Recommendations*

This research project is the first comprehensive assessment of produce and meat purchasing at the College of Charleston. While an important first step in discussing food procurement, it is important to note how this research can continuously be improved and sustainable purchasing increased. The following recommendations outline how the quality of food tracking can be improved for future research, increasing the AASHE sustainable percentage by increasing local purchasing, and how students can become more active and involved with their food system on campus.

My first recommendation is to improve transparency. Aramark Dining Services should continue to apply pressure to existing vendors to provide accurate and comprehensive data on food purchasing. As the vendor receiving the business from the College of Charleston, the responsibility of data should be on Limehouse Produce. One of the quickest ways to make data transparent is for Limehouse Produce to transition to invoices (both paper and electronic) that list the origin location for each product; this research recommends these invoices be modeled after the current system in place at Charleston's food hub, GrowFood Carolina. Figure 7 and 8 compare information from the invoices of the two vendors. It is important to note the emphasis on transparency in the GrowFood Carolina invoice and how origin information could be added to Limehouse Produce's invoice system.

LIMEHOUSE PRODUCE CO.		INVOICE DATE	INVOICE NO.	PAGE
4791 Trade Street • N. Charleston, SC 29418-2824 Ph. (843) 556-3400 • Fax (843) 556-3950		03/20/2013	379643	1
<b>SOLD TO</b> COLLEGE OF CHARLESTON ARAMARK 65 GEORGE ST. CHARLESTON, SC 29401 (843) 953-5539		<b>SHIP TO</b> CITY BISTRO CITY BISTRO (OLD-HUNGRY COUGAR) (843) 953-5414		
ORDER NO.	ORDER DATE	CUSTOMER NO.	SHIP VIA	PURCHASE ORDER NUMBER
379643	03/20/13	CO / CITYBIS	18987	ID-18987
ITEM #	DESCRIPTION	QUANTITY SHIPPED	UNIT PRICE	EXTENDED PRICE
10682	BROCCOLI PIZZA CUT 4/3#	2.00	18.85	37.70
10988	CARROT MATCHSTICK 4/5#	1.00	16.40	16.40
11401	CUCUMBER	1.00	34.10	34.10
13323	MESCLUN 3#	2.00	9.46	18.92
14702	PEPPER GREEN	1.00	17.55	17.55
15545	SPINACH BABY 4#	6.00	13.05	78.30
16020	TOMATO 6X6	2.00	21.35	42.70
16144	TOMATO GRAPE	2.00	13.75	27.50

Figure 6: Example of an Invoice from Limehouse Produce



# INVOICE

Remit to:  
 GrowFood Carolina  
 PO Box 1765  
 Charleston, SC 29402  
 843-727-0091

<b>Invoice #:</b> 17619	<b>Vendor ID:</b> Aramark - CofC - Cat			
<b>Customer Name:</b> Aramark - CofC - Catering	<b>Invoice Date:</b> 2014-09-16			
<b>Contact:</b> Jason Davidson	<b>Payment:</b> <input type="checkbox"/> Check <input type="checkbox"/> Cash <input type="checkbox"/> Invoice <input type="checkbox"/> Credit Card			
<b>Phone:</b> 843-953-5538	Check No. _____			
<b>Address:</b> 65 George Street Charleston, SC 29424				
Product	Grower	Quantity	Unit Price	Total Price
Blackberry, 5#, (#2's), Frozen <small>Product of the USA</small>	Maple Ridge Farm-Canadys, SC	1	\$30.00	\$30.00
Chevre, Plain 1# <small>Product of the USA</small>	Fishing Creek Creamery- Chester, SC	3	\$14.95	\$44.85
Pear, Soft, Rising Sun, Flat <small>Product of the USA</small>	Brickyard Point Farms-Lady's Island, SC	1	\$37.50	\$37.50
Pecan, Shelled Pieces, 1# <small>Product of the USA</small>	Brickyard Point Farms-Lady's Island, SC	2	\$12.50	\$25.00
Tomato, Cherry, Goldie, 10# <small>Product of the USA</small>	Hudson Family Farm - Rowesville, SC	1	\$30.50	\$30.50
Zucchini, 15# <small>Product of the USA</small>	Hickory Bluff Berry Farm-Holly Hill, SC	1	\$20.50	\$20.50
Pantry, Rice, Charleston Gold, 1# <small>Product of the USA</small>	Lavington Farms - Ace Basin, SC	10	\$4.00	\$40.00

Figure 7: Examples of an Invoice from GrowFood Carolina

The second recommendation that stems from this research is to increase purchasing from GrowFood Carolina. The first and only food hub in South Carolina, GrowFood Carolina was established by the Coastal Conservation League in 2011 and recently added as an official vendor with the College of Charleston in early summer 2015 (Taylor, 2013). Because of GrowFood Carolina's emphasis on locality (the hub only sources from within 120 miles of Charleston) all available produce and pantry items qualify as sustainable under the AASHE standards. As the food hub works closely with local growers before the planting seasons, a stronger partnership with GrowFood Carolina could increase the amount of produce grown for CofC as well as potentially encourage growers to utilize more sustainable practices in order to sell to the College. Currently working with growers to obtain Good Agricultural Practices (GAP) Certification, which is required by Aramark, this research recommends the partnership continue to grow. Additionally, promoting local purchasing with Limehouse Produce would also increase the sustainable percentage of food. The availability of produce in the state as well as the infrastructure to purchase locally would greatly add to the percentage of sustainable food purchased by the College. A 2011 study found that "local farmers could grow 70 percent of the area's most popular retail produce items for 43 percent of the year, and therefore supply 30 percent of the total yearly produce purchase of residents" in the Lowcountry (Appalachian Sustainable Food Project 2011; 15).

Third, purchasing meat and other produce from local and/or sustainably certified vendors should be encouraged. This research places a large emphasis on purchasing more locally--due in large part to the long growing season and availability in South Carolina, as well as the positive impacts for the local economy--but sustainably certified produce

and meat should also be a priority. Availability of meat that is local and/or humane is much more expensive and difficult to purchase on the level needed to serve the College of Charleston. For example, White Oak Pastures (Bluffton, Georgia) is one of only two humane certified slaughtering plants in the United States and is a vendor with Sysco, meaning that Aramark Dining Services could potentially source meat that meets the standards set by AASHE. However, the meat is drastically more expensive than vendors currently used by the College. In addition to White Oak Pastures, partnerships could be developed with area meat providers including Keegan-Fillion Farm (Walterboro, SC), Solo Verde Meats (Varnville, SC), and Greenbrier Farms (Easley, SC). It is important to note that working with local growers can also help increase transparency as these small operations can provide information on feed and slaughtering practices. Finally, sustainably certified produce such as Organic can also help increase the percentage of sustainable food as well.

Fourth, I recommend including more students into research of future projects. It is important to involve students to both reconnect them to their food system as well as help evolve their mindsets as the consumers on campus. As noted earlier, one of the responsibilities of higher education is to prepare students to become active citizens; with a population of more than 10,000 students enrolled at the liberal arts campus, providing more opportunities to become more engaged with their food system will be imperative to creating sustainable change. Involving students in actual projects align with the College of Charleston's mission statement that reads:

The College provides students a community in which to engage in original inquiry and creative expression in an atmosphere of intellectual freedom. This community, founded on the principles of the liberal arts tradition, provides

students the opportunity to realize their intellectual and personal potential and to become responsible, productive members of society (“Mission Statement”, 1)

In addition to the mission statement of the College, the current Quality Enhancement Plan (QEP) topic for the next ten years is focused on sustainability and student development (“QEP Selected Topic”, 1). The QEP could help facilitate students into projects that research sustainable food options and policy for the College. This recommendation could be carried out in a number of ways. First, at the undergraduate level, students could further research the origin, agricultural practices, and greenhouse gas emissions of certain foods, either in the realm of produce and meat, or beyond to include pantry items, dairy, and eggs, as well as vendors that qualify as sustainable under the AASHE standard. This coordination should be led by the Office of Sustainability and Aramark Dining Services to work with professors at the College. Table 15 outlines the potential courses that could be partnered with:

<b>Academic Department</b>	<b>Course Number</b>	<b>Title</b>	<b>Professor Name</b>	<b>Professor Email</b>
Economics	ECON 303/11177	Economics of Geography	Christopher Mothorpe	Mothorpeca@cofc.edu
Economics	ECON 360/13556	Economic Theory, Social Justice, and Public Policy	Daniela Goya- Tocchetto	Goyatocchettod@cofc.edu
Economics	ECON 311/11942	Environmental Economics	Richard Bilas	BilasR@cofc.edu
Entrepreneurship	ENTR 407/13566	Ecopreneurship	David Hansen	HansenD@cofc.edu
First Year Experience	FYSS 101/12307	Philosophy and Food	Deborah Boyle	BoyleD@cofc.edu
First Year Experience	FYSS 101/12330	Sociology of Food	Idee Winfield	WinfieldI@cofc.edu
Political	POLI	World Regional	Mark Long	LongM@cofc.edu



Science/Geography	104/11971 GEOG 101/10783	Geography		
Political Science	POLI 265/11562	International Political Economy	Hollis France	FranceH@cofc.edu
Political Science	POLI 369/13340	Politics of Globalization	Hollis France	FranceH@cofc.edu
Political Science	POLI 396/13342	Environmental Geography	Annette Watson	Watsonam@cofc.edu
Political Science	POLI 307	Environmental Policy	Matt Nowlin	Nowlinmc@cofc.edu
Political Science	POLI 405.02	Food	Mark Long	LongM@cofc.edu
Supply Chain Management	SCIM 371/ 12353	Green Supply Chain Management	Gioconda Quesada	QuesadaG@cofc.edu
Supply Chain Management	SCIM 373/ 13673	Supply Chain Planning and Analysis	Ted Shockley	Shockleytj@cofc.edu
Urban Studies	URST 313/ 13516	Sustainable Urbanism	Barry Stiefel	StiefelB@cofc.edu

**Table 14: List of Classes to Partner with Students**

Specifically, World Regional Geography (POLI 104/11971, GEOG 101/10783) could immediately begin to work with Aramark Dining Services on sustainable food projects. The main assignment of this course is to track three chosen products from origin to use, requiring students to research the social and environmental costs of these items. The course could incorporate food purchased by the College, creating a database of vendors and information. Not only can students earn academic credit, but also skills that translate to employment after graduation.

In addition to the working in the classroom, there are a number of ways students at the undergraduate level can become more involved in their food system. These opportunities include including joining the Office of Sustainability's student-run Garden Apprenticeship Program, as well as becoming a participant on an Alternative Break trip

with the College's Center for Civic Engagement. Currently, CCE runs an April trip to Immokalee, Florida to study Farmworker Health and new trips exploring other aspects of the food system (CAFOs in North Carolina, for example) could be added as well. It is our responsibility as educators working at an institution of higher learning to provide this opportunity. Sustainability cannot occur in isolation; therefore it is vital to first understand our impact and the responsibilities we have to the community in which we live. Students must be at the foundation for making more sustainable policy recommendations. As the consumers at the College of Charleston, this population will need to request better options and understand the increased costs that potentially might be a result of purchasing more locally and sustainably.

There are opportunities for students to also grow food for the College of Charleston in the future. Students at the graduate level can also work as a graduate assistant with the Masters of Environmental Studies Program on growing food for the College of Charleston. The College owns Dixie Plantation, 900+ acres of land in Hollywood, SC that can be used to grow food for the institution. Dixie Plantation is also an outlet for graduate research as well; currently one Dual Masters of Environmental Studies and Masters of Public Administration Candidate is assessing how Dixie Plantation can develop a Community Sponsored Agriculture Program and supply food to the College of Charleston. Her paper, *College of Charleston Student Farm: A Study in Social Enterprise* reviews the options available to Dixie Plantation and outlines the needs of Aramark Dining Services to buy food for the College from the student garden. The Grounds Department has multiple gardens across campus that are currently incorporating edible landscapes that could easily incorporate herbs for Aramark Dining Services. While

this is small scale growing in an urban landscape, this initiative can further involve students in their food system while increasing the number of sustainable purchases for the College.

One of the most unique aspects of this study--and the continued partnership between all parties--is the continued involvement of students both at the undergraduate and graduate levels. Aramark's Sustainability Intern is a position held by a student, first at the graduate level (my study), then by a recent graduate, as well as now an undergraduate student enrolled at the College of Charleston. This position is important to tracking purchases as well as other sustainability initiatives, including certifying dining halls as zero waste locations. I recommend maintaining the current structure, with the continued partnership between both offices.

Finally, a better tool to assess environmental impacts should be developed. As noted in this research, the CHEFS calculator is inept at producing accurate representations of greenhouse gas emissions for food purchases. Developing a comprehensive tool that is not only complete, but accessible is an absolute need for assessing food purchasing at the institutional level. Accessibility is an important requirement for this tool so students and offices of any funding level can begin to understand their impact and responsibility of food procurement. Sustainability Offices and Dining Services can use this tool to assess their food purchases, as well as prioritize transitions to more sustainable options can use a tool that creates complete outputs.

## *Conclusions*

It is important to note that there are many potential limitations to this study. Originally designed to show social and environmental impacts of our food system and purchases, the tools and information to accomplish this goal simply did not exist at the time of this research. The infrastructure for tracking food is still being built--particularly in Charleston--and this study is one of those first steps. While the data collected is robust, it is only one semester--and not a complete semester--of food purchases at the College. It does not include auxiliary locations or catering. The spring semester is also not the height of the growing season in South Carolina; there is potential that the number of locally sourced items increases in the fall when more traditional foods (squash, zucchini, etc.) are available.

This research project greatly aligns with the farm to table movement in the United States and especially in the Charleston, SC area. A 2015 study by Low, et. al, found that the local food movement is growing: "consumer, producer, and policymaker interest in local foods appears to be growing" (1). This study, also a report for Congress, found an increase in the interest of universities to purchase locally as well as the number of farm to table programs in public school districts (33). The Charleston area in particular has a booming local food movement; in addition to including hosting the state's only food hub, through the non-profit Lowcountry Local First, Charleston is also home to a Growing New Farmers program and Eat Local Month, which concludes with a "Chef's Potluck" that pairs local farmers with chefs in the area (Lowcountry Local First, 2016; 1). In April 2016, the *Charleston City Paper* ran multiple stories on local purchasing including

sourcing local food in food trucks (Gidick, 2016; 1) and highlighting the relationship between growers and restaurants (Wolf, 2016; 1; Hardaway, 2016; 1).

Great progress has been made in the very short time since this research was completed. Currently efforts are being made in not only food tracking, but also sustainable purchasing, and outreach. Michelle Crowe, the Director of Aramark Dining Services, became the champion for adding GrowFood Carolina as an official vendor with the College of Charleston; a milestone that was achieved in May 2015. Tracking purchases has now expanded to include Catering; since the start of this project great progress has been made in the area of sustainable purchasing. The following table represents the growth in not only tracking, but sustainable purchasing since this 2013 study:

Time Period (produce)	City Bistro	Liberty Fresh Food Co.	Catering (tracking began 2014)	Total
Jan.-Dec. 2014	10% \$10,321.73	8% \$10,700.34	11% \$6,257.55	9% \$27,279.62
Aug.-Dec. 2015	3.60% \$1,728.85	6.05% \$2,522.41	10% \$1,803.17	5.8% \$5,996.63

Table 15: Produce Purchasing Update

It is important to note that spring 2015 numbers are currently unavailable due to the lack of a Sustainability Intern during that time. Additionally, spring 2016 numbers look to be on the rise due to the increase in purchasing from GrowFood Carolina, as well as the number of partnered events between the Office of Sustainability and Aramark Dining Services. Local produce, dairy, grains, and eggs from GrowFood Carolina are now available to offices hosting events on campus and the dining halls are continuing efforts to purchase from the food hub as well. In addition to the increase in local purchasing, the outreach and partnership between Aramark Dining Services, GrowFood

Carolina, and the Office of Sustainability continues to grow. Now one of the Office of Sustainability's best partners on campus, Aramark Dining Services has hosted locally sourced pop up restaurants, collaborated on farmers markets, and their Executive Chef has been on multiple panels discussing issues of social justice in Charleston.

Rather than focusing on the difficulties of compiling these data, this report recommends starting slow; it is important to understand limitations exist and focusing on how to overcome the obstacles rather than the problems themselves will be the best way forward. While efforts to understand our food system at the College of Charleston started small, progress in tracking and increasing sustainable purchasing has been made through furthering relationships between on and off campus partners. This research project was the very first and important step to beginning to starting a now very successful sustainable purchasing program at the College of Charleston.

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## Appendices

### Appendix A: Produce Purchases for the College of Charleston (Spring 2013) by Location

(Y=Yes, P=Potentially, N=No)

Item Name	Shipped From	Miles	Business Vendor Name	Ship From Name	Origin?	Sustainable?	QTY LBS	Total Cost (\$)
Mushroom, Shiitake	MONCKS CORNER, SC	29	MEPKIN ABBEY	MEPKIN ABBEY	Y	Y	24	168
Tomato, 5x6	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	25	22.35
Tomato, 6x6	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	1900	1449.6
Tomato, Grape	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	1540	2443.85
Tomato, Green	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	75	53.75
Tomato, Plum	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	125	90.25
Tomato, Vineripe	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	175	103.95
Tomato, Yellow	LODGE, SC	62	WILLIAMS FARMS REPACKERS, LLC	WILLIAMS FARMS REPACKERS, LLC	P	P	25	29.35
Pea, Blackeye	EFFINGHAM, SC	89	MCCALL FARMS INC.	MCCALL FARMS INC.	P	P	40	43.04
Collards, Chop	PELION, SC	102	WALTER P RAWLS & SONS	WALTER P RAWLS & SONS	P	P	72	95.1
Collards, Green Chop	PELION, SC	102	WALTER P RAWLS & SONS	WALTER P RAWLS & SONS	P	P	156	228.65
Lemon, Minipak	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	35	58
Lime	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	10	17.05
Potato, Red	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	20	18.75
Radish, Red Cello	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	1.125	3.48
Sprout, Alfalfa	WEST COLUMBIA, SC	106	SOLAR FARMS, INC	SOLAR FARMS, INC	Y	Y	120	45.4
Sprout, Mung Bean	WEST COLUMBIA, SC	106	SOLAR FARMS, INC	SOLAR FARMS, INC	Y	Y	75	99
Squash, Butternut	WEST COLUMBIA, SC	106	VB HOOK&CO INC	VB HOOK & CO	P	P	6	44.6
Strawberry	MCBEE, SC	118	MAC'S PRIDE	MAC'S PRIDE	Y	Y	600	219.6
Cabbage, Green	FAISON, NC	191	BURCH FARMS	BURCH FARMS	Y	Y	760	339.15
Potato, Sweet #1	FAISON, NC	191	BURCH FARMS	BURCH FARMS	Y	Y	40	14.4
Potato, Sweet Jumbo	SNOW HILL, NC	225	HAM PRODUCE CO INC	HAM PRODUCE CO INC	P	P	3800	1699.1
Carrot, Cello	FOREST PARK, GA	236	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	P	P	385	96
Squash, Butternut	LAKE PARK, GA	236	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	210	191.5
Cucumber	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	375	538.53
Eggplant, Whole	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	3	6.76
Eggplant, Whole	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	24	21.42
Pepper, Green	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	1500	1047
Zucchini, #2	LAKE PARK, GA	239	COGGINS PRODUCE INC.	FRESH LINK CONSOLIDATION LLC	P	P	10	7.62
Carrot, Baby Organic	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	Y	25	26.19
Arugula, Baby	FOREST PARK, GA	263	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	N	N	1440	1533.7
Cabbage, Red	FOREST PARK, GA	263	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	N	N	6	39.6
Eggplant, Whole	FOREST PARK, GA	263	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	N	N	3	10.3
Jalapeno	FOREST PARK, GA	263	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	N	N	30	21.48
Onion, Diced	FOREST PARK, GA	263	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	N	N	12	42.63
Pepper, Green Sliced	FOREST PARK, GA	263	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	N	N	36	51.54
Shallot, Peeled	FOREST PARK, GA	263	FRESHPOINT REPACKERS ATLANTA	FRESHPOINT REPACKERS ATLANTA	N	N	5	13.23



Apple, Fuji	ATLANTA, GA	266	NICKEY GREGORY COMPANY, LLC	NICKEY GREGORY COMPANY, LLC	N	N	375	67.7
Edamame, Soybean Whole	ATLANTA, GA	266	JR SIMPLOT CO NAMPA	JR SIMPLOT	P	N	30	43.08
Endamame, Soybean Whole	ATLANTA, GA	266	JR SIMPLOT CO NAMPA	JR SIMPLOT	N	N	75	88.05
Tomato, Yellow	ATLANTA, GA	266	NICKEY GREGORY COMPANY, LLC	NICKEY GREGORY COMPANY, LLC	P	N	180	374.4
Vegetable Blend, Pepper	ATLANTA, GA	266	JR SIMPLOT CO NAMPA	JR SIMPLOT	N	N	110	88.88
Watermelon, Seedless	ATLANTA, GA	266	NICKEY GREGORY COMPANY, LLC	NICKEY GREGORY COMPANY, LLC	P	N	3500	1168.25
Potato, Red	LAKE WALES, GA	272	MACK FARMS	MACK FARMS	Y	N	200	430
Mushroom, Cremini	LOUDON, TN	324	MONTEREY MUSHROOMS	MONTEREY MUSHROOMS	P	N	385	985.6
Mushroom, Portabello	LOUDON, TN	324	MONTEREY MUSHROOMS	MONTEREY MUSHROOMS	P	N	10	31.75
Mushroom, Shiitake	LOUDON, TN	324	MONTEREY MUSHROOMS	MONTEREY MUSHROOMS	P	N	1135	2116
Mushroom, Sliced	LOUDON, TN	324	MONTEREY MUSHROOMS	MONTEREY MUSHROOMS	P	N	18	92.01
Arugula	FELLSMERE, FL	348	B&W QUALITY GROWERS	B&W QUALITY GROWERS	P	N	32	47.4
Strawberry	DOVER, FL	357	BERRY BOSS STRAWBERRIES	BERRY BOSS STRAWBERRIES	Y	N	200	82
Strawberry	MULBERRY, FL	358	SIZEMORE FARMS, INC.	SIZEMORE FARMS, INC.	Y	N	4000	494.2
Grapefruit	FORT PIERCE, FL	369	DNE WORLD FRUIT SALES	DNE WORLD FRUIT SALES	P	N	300	41.7
Orange	FORT PIERCE, FL	369	DNE WORLD FRUIT SALES	DNE WORLD FRUIT SALES	P	N	200	320.3
Tangerine	FORT PIERCE, FL	369	DNE WORLD FRUIT SALES	DNE WORLD FRUIT SALES	P	N	3500	1867
Celery, Stick	SMYRNA, TN	436	TAYLOR FARMS	TAYLOR FARMS/TENN	P	N	3000	2404.3
Cantaloupe	DEERFIELD BEACH, FL	446	CLASSIC FRUIT COMPANY	CLASSIC FRUIT COMPANY	N	N	32	58.4
Honeydew	DEERFIELD BEACH, FL	446	CLASSIC FRUIT COMPANY	CLASSIC FRUIT COMPANY	N	N	360	510.65
Tomato, Grape	IMMOKALEE, FL	448	FELDA TOMATO GROWERS, INC.	FELDA TOMATO GROWERS, INC.	Y	N	175	130.95
Tomato, Plum	IMMOKALEE, FL	448	FELDA TOMATO GROWERS, INC.	FELDA TOMATO GROWERS, INC.	Y	N	2000	1434.7
Tomato, Vineripe	IMMOKALEE, FL	448	FELDA TOMATO GROWERS, INC.	FELDA TOMATO GROWERS, INC.	Y	N	10	13.4
Kiwi	MIAMI, FL	485	HARVEST SENSATIONS	HARVEST SENSATIONS	N	N	70	118.8
Pea, Snow	MIAMI, FL	485	HARVEST SENSATIONS	HARVEST SENSATIONS	N	N	10	55.2
Starfruit	MIAMI, FL	485	HARVEST SENSATIONS	HARVEST SENSATIONS	P	N	40	56.45
Lime	PRINCETON, FL	501	NEW LIMECO, LLC	NEW LIMECO, LLC	P	N	72	75.6
Vegetable Blend, California	SEABROOK, NJ	534	SEABROOK BROTHERS & SONS	SEABROOK BROS	P	N	40	26.65
Jicama	ATLANTIC CITY, NJ	549	SEASHORE FRUIT & PRODUCE CO.	SEASHORE FRUIT & PRODUCE CO.	N	N		111.8
Plum, Red	ATLANTIC CITY, NJ	549	SEASHORE FRUIT & PRODUCE CO.	SEASHORE FRUIT & PRODUCE CO.	N	N		37.6
Pluot	ATLANTIC CITY, NJ	549	SEASHORE FRUIT & PRODUCE CO.	SEASHORE FRUIT & PRODUCE CO.	N	P	172	4030.45
Green Bean, Trimmmed	BOWLING GREEN, OH	629	GREENLINE FOODS, INC.	GREENLINE FOODS, INC.	Y	N	915	1705.07
Potato, Sweet Fry	DELHI, LA	673	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON SALES	N	N	120	140.8
Bean, Lima Baby	STRATHROY, ON	710	BONDUELLE CANADA	BONDUELLE CANADA	P	N	30	21.08
Carrot, Diced	STRATHROY, ON	710	BONDUELLE CANADA	BONDUELLE CANADA	N	N	30	23.03
Carrot, Sliced	STRATHROY, ON	710	BONDUELLE CANADA	BONDUELLE CANADA	N	N	5	21.12
Okra, Cut	GILMER, TX	872	PICTSWEET FROZEN FOODS	PICTSWEET FROZEN FOODS	P	N	108	110.63
Bean, Green Whole Haricot	BEDFORD, QC	936	BONDUELLE CANADA	BONDUELLE CANADA	P	N	240	362.07
Brussel Sprout	BEDFORD, QC	936	BONDUELLE CANADA	BONDUELLE CANADA	N	N	60	56.11
Pea, Green	BEDFORD, QC	936	BONDUELLE CANADA	BONDUELLE CANADA	N	N	330	310.36
Avacodo, Halves	KELLER, TX	1004	FRESHERIZED FOODS	FRESHERIZED FOODS	P	N	4.5	27.43
Blackberry	MILBRIDGE, ME	1039	JASPER WYMAN & SON	JASPER WYMAN & SON	P	N	70	165.1
Potato, Diced	MINNEAPOLIS, MN	1105	MICHAEL FOODS EGG & DAIRY	MICHAEL FOODS	N	N	80	62.36

Potato, Hash Brown	MINNEAPOLIS, MN	1105	MICHAEL FOODS EGG & DAIRY	MICHAEL FOODS	N	N	980	763.91
Potato, Sliced	MINNEAPOLIS, MN	1105	MICHAEL FOODS EGG & DAIRY	MICHAEL FOODS	N	N	200	171.49
Potato, Sliced 1/8	MINNEAPOLIS, MN	1105	MICHAEL FOODS EGG & DAIRY	MICHAEL FOODS	N	N	300	233.85
Potato, Wedge	MINNEAPOLIS, MN	1105	MICHAEL FOODS EGG & DAIRY	MICHAEL FOODS	N	N	1420	1491
Vegetable Blend	SAN ANTONIO, TX	1122	SUPERIOR FOODS	SUPERIOR FOODS	N	N	160	260.77
Vegetable Blend, California	SAN ANTONIO, TX	1122	SUPERIOR FOODS	SUPERIOR FOODS	N	N	180	176.02
Vegetable Blend, Capri	SAN ANTONIO, TX	1122	SUPERIOR FOODS	SUPERIOR FOODS	N	N	360	380.55
Vegetable Blend, Garden	SAN ANTONIO, TX	1122	SUPERIOR FOODS	SUPERIOR FOODS	N	N	180	147.28
Vegetable Blend, Italian	SAN ANTONIO, TX	1122	SUPERIOR FOODS	SUPERIOR FOODS	N	N	120	121.6
Vegetable Blend, Winter	SAN ANTONIO, TX	1122	SUPERIOR FOODS	SUPERIOR FOODS	N	N	288	303.44
Potato, Idaho	IDAHO FALLS, ID	1182	MCNEIL	MCNEIL	N	N	1700	929.75
Squash & Zucchini, Sliced	MCALLEN, TX	1189	RFS LTD EXPOR	RFS LTD EXPOR	P	N	1075	1522.32
Blueberry	MISSION, TX	1194	PACKER FOOD PRODUCTS	GEMS OF FRUIT CO	N	N	72	74.08
Banana	SAN PEDRO SULA, HN	1298	CHIQUITA BANANAS, INC	CHIQUITA BANANAS, INC	Y	N	150	386.73
Pineapple, Golden Ripe	PORT LIMON, CR	1540	THE OPPENHEIMER GROUP	THE OPPENHEIMER GROUP	Y	N	8960	8589.84
Avocado	MICHOACAN, MX	1626	THE OPPENHEIMER GROUP	THE OPPENHEIMER GROUP	Y	N	5175	3270.4
Pepper, Red	NOGALES, AZ	1813	C&R FRESH, LLC	C&R FRESH, LLC	N	N	40	38.35
Pepper, Yellow	NOGALES, AZ	1813	PRIME TIME INTERNATIONAL	PRIME TIME INTERNATIONAL	Y	N	525	1001.81
Squash, #2	CIUDAD OBREGON, MX	1825	EL CHICURAL	VP FRESH	Y	N	450	633.82
Squash, Yellow #2	CIUDAD OBREGON, MX	1825	EL CHICURAL	VP FRESH	Y	N	380	505.45
Potato, Diced Breakfast	TWIN FALLS, ID	1991	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	680	802.7
Potato, Pancake Mini	TWIN FALLS, ID	1991	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	5800	875.27
Cauliflower	YUMA, AZ	2009	NUNES COMPANY, INC	FOXY	P	N	1872	2190.3
Celery	YUMA, AZ	2009	NUNES COMPANY, INC	FOXY	P	N	306	576.44
Celery	YUMA, AZ	2009	NUNES COMPANY, INC	FOXY	P	N	90	56.82
Lettuce, Iceberg	YUMA, AZ	2009	NUNES COMPANY, INC	FOXY	P	N	156	29.93
Onion, Jumbo Yellow	ONTARIO, OR	2131	BAKER PACKING CO.	BAKER PACKING CO.	N	N	180	83.08
Onion, Red	ONTARIO, OR	2131	BAKER PACKING CO.	BAKER PACKING CO.	N	N	750	502.3
Pepper, Red	CHULA VISTA, CA	2151	PRIME TIME INTERNATIONAL	PRIME TIME INTERNATIONAL	P	N	60	53.08
Pepper, Yellow	CHULA VISTA, CA	2151	PRIME TIME INTERNATIONAL	PRIME TIME INTERNATIONAL	Y	N	15	18.25
Mango, Sliced	LOS ANGELES, CA	2200	SIMPLY FRESH FRUIT	SIMPLY FRESH FRUIT	N	N	4	91.88
Carrot, Shoestring	ARVIN, CA	2223	GRIMMWAY FROZEN FOOD	GRIMMWAY FARMS PRODUCE	Y	N	1800	224.8
Lemon	ARVIN, CA	2223	SUNKIST GROWERS, INC.	SUNKIST GROWERS, INC.	P	N	1	6.28
Carrot, Cello	BAKERSFIELD, CA	2232	BOLTHOUSE FARMS	BOLTHOUSE FARMS	N	N	144	273.3
Strawberry, Whole	BAKERSFIELD, CA	2232	ANACAPA FOODS LLC	ANACAPA FOODS LLC	P	N	250	459.5
Blackberry	OXNARD, CA	2252	DRISCOLL'S	DRISCOLL'S	P	N	9	45.29
Strawberry	OXNARD, CA	2252	DRISCOLL'S	DRISCOLL'S	P	N	80	158.8
Orange	FOWLER, CA	2259	BEE SWEET CITRUS	BEE SWEET CITRUS	P	N	80	19.04
Peach, Sliced	CLOVIS, CA	2260	WAWONA FROZEN FOODS	WAWONA FROZEN FOODS *1	P	N	100	194
Potato, 1/8 Chip	KENNEWICK, WA	2260	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	660	747.7
Potato, 3/8 Fries	KENNEWICK, WA	2260	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	9030	6521.23
Potato, Fry Crissect	KENNEWICK, WA	2260	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	459	572.24
Potato, Fry Twister	KENNEWICK, WA	2260	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	90	110.91

Potato, Steak House Fry	KENNEWICK, WA	2260	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	270	275.31
Potato, Tator Puff	KENNEWICK, WA	2260	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	900	1016.48
Potato, Yukon Gold Chip	KENNEWICK, WA	2260	CONAGRA SPEC POTATO(LAMB WEST)	LAMB WESTON	N	N	90	106.65
Corn, Cob Petite	MOSES LAKE, WA	2279	NATIONAL FROZEN FOODS CORP	NATIONAL FROZEN FOODS	N	N	198	261.87
Corn, Cob Petite	MOSES LAKE, WA	2279	NATIONAL FROZEN FOODS CORP	NATIONAL FROZEN FOODS	N	N	126	727.43
Corn, Whole Kernel	MOSES LAKE, WA	2279	NATIONAL FROZEN FOODS CORP	NATIONAL FROZEN FOODS	N	N	1192	1114.28
Apple, Gold	YAKIMA, WA	2329	DOMEX SUPERFRESH	DOMEX SUPERFRESH	P	N	3000	700
Apple, Granny	YAKIMA, WA	2329	DOMEX SUPERFRESH	DOMEX SUPERFRESH	P	N	1750	519.5
Apple, Honeycrisp	YAKIMA, WA	2329	DOMEX SUPERFRESH	DOMEX SUPERFRESH	P	N	125	57.35
Apple, Lady Gala	YAKIMA, WA	2329	DOMEX SUPERFRESH	DOMEX SUPERFRESH	P	N	125	23.35
Apple, Red	YAKIMA, WA	2329	DOMEX SUPERFRESH	DOMEX SUPERFRESH	P	N	150000	3604.25
Pear	YAKIMA, WA	2329	DOMEX SUPERFRESH	DOMEX SUPERFRESH	P	N	960	876.4
Asparagus	SALINAS, CA	2368	NEW STAR	NEW STAR	N	N	11	27.8
Bok Choy	SALINAS, CA	2368	TANIMURA & ANTLE	TANIMURA & ANTLE	P	N	60	41.25
Broccoli, Cut Pizza	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	N	N	3864	5170.27
Cabbage, Slaw Mix	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	420	314.66
Carrot, Baby Slim	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	1920	2040.06
Carrot, Matchstick	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	225	577.2
Cauliettes	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	380	435.72
Green Leaf Filets	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	140	257.46
Leek	SALINAS, CA	2368	TANIMURA & ANTLE	TANIMURA & ANTLE	P	N	100	101.13
Leek, Bunch	SALINAS, CA	2368	TANIMURA & ANTLE	TANIMURA & ANTLE	P	N	4.5	21.05
Lettuce, Iceberg	SALINAS, CA	2368	TANIMURA & ANTLE	TANIMURA & ANTLE	P	N	1300	664.42
Lettuce, Iceberg	SALINAS, CA	2368	D'ARRIGO BROS. CO.	ANDY BOY	P	N	100	47.76
Lettuce, Shred	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	1680	1367.18
Mesculun	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	396	1252.21
Onion, Green	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	136	284.24
Romaine, Chop	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	3132	5153.17
Romaine, Lettuce Crown Leaves	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	40	118.2
Spinach, Baby	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	948	3176.49
Spinach, Cello	SALINAS, CA	2368	TAYLOR FARMS	TAYLOR FRESH FOOD	P	N	830	1329.56
Strawberry	SALINAS, CA	2368	NATURIFE GROWERS, INC	NATURIFE GROWERS, INC	P	N	936	1222.83
Mango, Chunk	WATSONVILLE, CA	2372	ITAS CORP	SUPERIOR FOODS INTERNATIONAL	N	N	200	305.42
Raspberry, Red Whole	WATSONVILLE, CA	2372	ITAS CORP	SUPERIOR FOODS INTERNATIONAL	P	N	10	24.75
Raspberry, Bits	FAIRVIEW, OR	2411	TOWNSEND FOODS	TOWNSEND FOODS	P	N	60	131.32
Green Bean, Italian Cut	CHEHALIS, WA	2445	NATIONAL FROZEN FOODS CORP	NATIONAL FROZEN FOOD	N	N	144	154.8
Pea & Carrot, Mix	CHEHALIS, WA	2445	NATIONAL FROZEN FOODS CORP	NATIONAL FROZEN FOOD	N	N	300	293.46
Pea & Carrot, Mix	CHEHALIS, WA	2445	NATIONAL FROZEN FOODS CORP	NATIONAL FROZEN FOOD	N	N	150	138
Pea & Pearl Onion, Mix	CHEHALIS, WA	2445	NATIONAL FROZEN FOODS CORP	NATIONAL FROZEN FOOD	N	N	60	80.45
Asparagus	CALLAO, PE	3106	HARVEST SENSATIONS	HARVEST SENSATIONS	P	N	396	907.65
Mango, Ripe	CALLAO, PE	3106	HARVEST SENSATIONS	HARVEST SENSATIONS	P	N	10	10.65

## Appendix B: Meat Purchases for the College of Charleston (Spring 2013) by Location

(Y=Yes, P=Potentially, N=No)

Item Name	Shipped From	Miles	Business Vendor Name	Ship From Name	Slaughter, Processing	Sustainable?	Total QTY	Total Cost (\$)
Pork, Chop	MT PLEASANT, SC	9	SPECIALTY FOOD SOLUTIONS, INC	SPECIALTY FOOD SOLUTIONS, INC	Closed	N	140	379.54
Chicken, BRD Popcorn	BATESBURG, SC	132	AMICK FARMS	AMICK FARMS	Slaughter, Processing	N	2160	2782.08
Chicken, CVP Wing JMBO	BATESBURG, SC	132	AMICK FARMS	AMICK FARMS	Slaughter, Processing	N	160	78.15
Pork, Loin Center	TAR HEEL, NC	150	SMITHFIELD FOODSERVICE GROUP	SMITHFIELD FOODSERVICE	Slaughter, Processing	N	2447.69	4135.62
Pork, Boston Butt	TAR HEEL, NC	150	SMITHFIELD FOODSERVICE GROUP	SMITHFIELD FOODSERVICE	Slaughter, Processing	N	1232.1	1484.84
Turkey, Smoked	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	996.54	3660.08
Turkey, Ground FRZ	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	360	438.12
Turkey, Breast O/R	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	2121.6	6182.12
Turkey, Patty Frozen	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	160	438.05
Turkey, Burger Pepper	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	359.78	877.95
Turkey, Bacon Layflat	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	12	33.23
Turkey, BRST Raw	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	501.38	1543.61
Turkey, Meat Pulled	MOUNT OLIVE, NC	198	CAROLINA TURKEY	BUTTERBALL LLC	Slaughter, Processing	N	60	38.97
Sausage, Patty Raw	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	288	859.68
Sausage, Link	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	229	456.57
Sausage, Pork Patty	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	680	1420.63
Sausage, Rope Kielbasa	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	198	808.58
Turkey, Sausage Link	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	288	734.88
Ham, Steak	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	75	350.27
Sausage, Italian Link	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	480	1312.4
Pork, Sausage Patty	MACON, GA	215	SARA LEE BAKERY	HILLSHIRE BRANDS COMPANY	Warehouse	N	396	956.01
Pork, Chop	CLAYTON, NC	216	SMITHFIELD FOODSERVICE GROUP	SMITHFIELD FOODSERVICE	Warehouse	N	90	285.48
Chicken, CVP 8 PC Cut	GAINESVILLE, GA	258	MAR-JAC	MAR JAC POULTRY	Slaughter, Processing	N	1354.73	1775.48
Chicken, CVP 9 PC Cut	GAINESVILLE, GA	258	MAR-JAC	MAR JAC POULTRY	Slaughter, Processing	N	291.03	283.25
Chicken, CVP 8 PC	GAINESVILLE, GA	258	MAR-JAC	MAR JAC POULTRY	Slaughter, Processing	N	44.04	55.93
Pork, Sausage TRY	KODAK, TN	306	SWAGGERTY SAUSAGE CO INC	SWAGGERTY SAUSAGE CO INC	Slaughter, Processing	N	24	56.96
Pork, Chop Precooked	ATLANTA, GA	307	DUTCH QUALITY HOUSE	WAYNE FARMS	Slaughter, Processing	N	90	275.67
Beef, Stew Meat	AUBURNDALE, FL	344	SYSKO MEAT CO	BUCKHEAD BEEF FLORIDA	Processing	N	330.16	1258.73
Beef, Brisket CKD Smoked	AUBURNDALE, FL	344	SYSKO MEAT CO	BUCKHEAD BEEF FLORIDA	Processing	N	307.57	1340.66
Pork, Sausage Link Andouille	ROCKMART, GA	353	ADVANCE FOOD CO	ADVANCEPIERRE FOODS	Warehouse	N	80	130.8
Meatball, Italian	MURFREESBORO, TN	425	RICH FOODS	RICH PRODUCTS CORP	Warehouse	N	690	1824.71
Chicken, CVP BRST	COLLINS, MS	538	-	SANDERSON FARMS INC 1	Slaughter, Processing	N	130	546.59
Bacon, Canadian	DAYTON, OH	538	HORMEL	HORMEL FOODS *1	Warehouse	N	24	273.4
Beef, Corned Sliced	DAYTON, OH	538	HORMEL	HORMEL FOODS *1	Warehouse	N	191.84	427.81
Pork, Loin BNLS	DAYTON, OH	538	HORMEL	HORMEL FOODS *1	Warehouse	N	27.5	95.15
Pork, Pepperoni Stick	DAYTON, OH	538	HORMEL	HORMEL FOODS *1	Warehouse	N	80	315.6
Chicken, Meat Pulled	DAYTON, OH	538	HORMEL	HORMEL FOODS *1	Warehouse	N	35	38.41
Pork, Bacon Fat	DAYTON, OH	538	HORMEL	HORMEL FOODS *1	Warehouse	N	80	523.36
Beef, HEB NAT Frank	MIAMI, FL	584	CONAGRA FRZ & REFRIGERATED	CONAGRA FOODS	Warehouse	N	40	122.36

Bologna, Steak	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	114	266.67
Salami, Genoa	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	404.66	1367.77
Bacon, Center Cut	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	885	3380.24
Ham, Pit SMKD	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	274.41	751.88
Beef, Roast Pot	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	484.65	2103.34
Bacon, Layflat Applewood	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	120	470.56
Pork, Pepperoni	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	325	643.44
Pork, Bacon Precooked	INDIANAPOLIS, IN	585	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	112.5	212.34
Ham, Buffet	INDIANAPOLIS, IN	595	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	1594	4673.1
Frank, All Beef	INDIANAPOLIS, IN	595	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	570	1647.3
Beef, Roast Split	INDIANAPOLIS, IN	595	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	1530	5930.97
Beef, Corned Flat	INDIANAPOLIS, IN	595	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Warehouse	N	63.14	282.25
Chicken, BRST CVP	COLLINS, MS	681	-	SANDERSON FARMS INC 1	Slaughter, Processing	N	54.51	206.61
Beef, Flank Steak	PLAINWELL, MI	737	MURCO	MURCO	Slaughter, Processing	N	440	750.4
Turkey, Breast Oven RST	CHICAGO, IL	758	DAN'S PRIZE	DAN'S PRIZE *1	Warehouse	N	1933.54	5061.95
Pork, Ham Bone SMKD	CHICAGO, IL	758	DAN'S PRIZE	DAN'S PRIZE *1	Warehouse	N	30	117.09
Beef, Corned Top	CHICAGO, IL	758	DAN'S PRIZE	DAN'S PRIZE *1	Warehouse	N	242.15	510.77
Gyro, Sliced	ELK GROVE VILLAGE, IL	775	GRECIAN DELIGHT	GRECIAN DELIGHT	Processing	N	20	94.5
Wing, Chicken 1 & 2	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS *1	Processing	N	110	381.7
Chicken, Breast Even	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	510	4431.32
Chicken, Breaded PTY Raw	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	3460	10742.15
Chicken, Ground Raw	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	960	1878.15
Breast, Chicken FRZ	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	940	1485.2
Chicken, Breast Seasoned	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	2394	3119.18
Chicken, Breast, Thigh	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	80	245.08
Chicken, Tender BRD	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	4240	6702.05
Chicken, CVP 8 PC Cut	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	360	1346.6
Chicken, JMbo Tender	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS *1	Processing	N	470.56	606.03
Chicken, BRSTB/S Cooked	RUSSELLVILLE, AR	775	TYSON FOODS	TYSON FOODS	Processing	N	1360	2468.19
Chicken, BRST B/S MARN	RUSSELLVILLE, AR	775	TYSON FOODS	TYSON FOODS	Processing	N	100	314.4
Chicken, TPTY BRD	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	100	270.1
Chicken, PTY	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	54.36	122.85
Chicken, BRST PTY	RUSSELLVILLE, AR	775	TYSON FOODS POULTRY DIV	TYSON FOODS	Processing	N	10.06	14.84
Bacon, Layflat 18/22	MONMOUTH, IL	816	ARMOUR ECKRICH MEATS LLC	ARMOUR ECKRICH MEATS LLC	Slaughter, Processing	N	25	18.68
Beef, Ground Patty 75/25	MILWAUKEE, WI	831	CARGILL FDSC MEAT SOLUTIONS	CARGILL EMMPAK	Processing	N	4020	9215.97
Beef, Angus Patty SEA	MILWAUKEE, WI	831	CARGILL FDSC MEAT SOLUTIONS	CARGILL EMMPAK	Processing	N	720	1796.71
Beef, Ground 75/25 FRSH	MILWAUKEE, WI	831	CARGILL FDSC MEAT SOLUTIONS	CARGILL EMMPAK	Processing	N	810	2416.51
Beef, Ground PTY	MILWAUKEE, WI	831	CARGILL FDSC MEAT SOLUTIONS	CARGILL EMMPAK	Processing	N	200	534.2
Bacon, Bit Fine	EAST DUBUQUE, IL	890	FARMLAND FOODS	FARMLAND FOODS	Warehouse	N	510	3781.44
Pork, Diced Cube	EAST DUBUQUE, IL	890	FARMLAND FOODS	FARMLAND FOODS	Warehouse	N	300	662.43
Beef, Ground 85/15	GREEN BAY, WI	921	GREEN BAY DRESSED BEEF	AMERICAN FOODS GROUP LLC	Processing	N	387.17	1029.81
Beef, Ground Bulk	GREEN BAY, WI	921	GREEN BAY DRESSED BEEF	AMERICAN FOODS GROUP LLC	Processing	N	343.45	895.28
Sausage, Crumble Italian	OLATHE, KS	934	TYSON PREPARED FOODS	TYSON FOODS TPFPG	Warehouse	N	140	275.51

Pork, Ham Buffet	OLATHE, KS	934	TYSON PREPARED FOODS	TYSON FOODS TPFPG	Warehouse	N	65.8	173.71
Pork, Pepperoni Sliced	OLATHE, KS	934	TYSON PREPARED FOODS	TYSON FOODS TPFPG	Warehouse	N	50	107.58
Beef, Steak Philly	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	280	774.01
Beef, Steak Philly	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	80	214.72
Beef, Steak Fritter	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	410	1036.43
Pork, Rib Pre-Cooked	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	119.25	307.08
Steak, Salisbury Cooked	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	210	602.91
Beef, Steak Philly Bulk	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	50	190
Beef, Steak Fritter	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	149.91	402.45
Beef, Steak Philly	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	60	228
Pork, Chop Cubed	ENID, OK	1050	ADVANCE FOOD CO	ADVANCE FOOD CO	Processing	N	40	293.2
Pork, Sausage Rope Andouille	ROSENBERG, TX	1128	HOLMES SMOKEHOUSE	HOLMES SMOKEHOUSE	Not Sure?	N	150	394.05
Pork, Rib BCH BLK	AMARILLO, TX	1413	TYSON FRESH MEATS	TYSON FRESH MEATS *1	Slaughter, Processing	N	481.01	1120.75
Beef, BCH BLK RND	AMARILLO, TX	1413	TYSON FRESH MEATS	TYSON FRESH MEATS *1	Slaughter, Processing	N	368.08	1023.73