LOCAL FOOD PRODUCTION AND INSTITUTIONAL PURCHASING:
ASSESSING PRODUCER CONSUMER RELATIONSHIPS AT DUKE UNIVERSITY

by

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May 2011

Masters project submitted in partial fulfillment of the requirements for the Master of Environmental Management degree in the Nicholas School of the Environment of Duke University 2011
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Abstract

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Green purchasing policies are one aspect of campus sustainability that has been receiving increasingly more interest at Duke University in the past three years. Concurrently, locally supported food systems have been developing in the Research Triangle area, represented by farmers’ markets, community supported agriculture, and retail cooperatives. Furthermore, within the Duke Dining Services office, increased purchasing of locally produced food has been identified as one of the top three opportunities being pursued by the Dining Director. This study utilizes a farm-based survey to develop knowledge of the producer subsystem of the local food system, and interviews of dining operators at Duke to understand the current use of local food in purchasing policies. Local, small farmers are still relying heavily on farmers’ markets as their main source of income, but many are branching out into other markets such as retail and restaurants. Of the dining operators with the ability to use local food in their operations, six out of ten were currently choosing to purchase locally, although some more than others. This provides the university with a strong base to develop future policies to encourage increased relationships between farmers and operators.

Approved

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Dr. Marie Lynn Miranda

Date

Master's Project submitted in partial fulfillment of the requirements for the Master of Environmental Management degree in the Nicholas School of the Environment, Duke University May 2011
Introduction

The choices consumers make with regard to what and how they choose to purchase food has become a national topic of conversation, leading to what is commonly referred to in the media as the “local food movement.” Widely popular books and articles from authors such as Michael Pollan (The Omnivore’s Dilemma, In Defense of Food, Food Rules) and Barbara Kingsolver (Animal, Vegetable, Miracle) examine the relationship between humans and food and advocate for alternate systems to the current industrial model of food production. That industrial model is dominated by a small number of large transnational corporations, whereas the alternative relies on direct links between consumers and producers. Terms like organic, that used to dominate the lexicon of alternative systems, are now giving way to ideas of local, and what it means to truly maintain a sustainable food system. This movement is being driven on the production side by small farmers and on the consumption side by individuals and organizations interested in promoting sustainable practices.

A local model that provides an example of this alternative system is Fickle Creek Farm, a 145 acre farm in Efland, NC that supports a variety of livestock, a vegetable garden, and a bed and breakfast. The main components of the production system are rotational grazing, low inputs, native flora, and integration with the native ecosystem. The idea that the production system should, in as many ways as possible, mimic the natural system is ingrained in the processes and design of the farm. On the output side, Fickle Creek serves a variety of markets including a number of farmers’ markets, a grocer, and five restaurants. Its distribution is no greater than 25 miles from the farm. The motivation for this study arose from two factors. First, a visit to this farm, and a conversation with the farmers who manage it, helped me to understand how these systems function in practice. If Fickle Creek Farm is successfully utilizing this system, how
many other farmers in the area are doing a similar thing? Second, conversations at Duke had turned heavily toward making the campus a more sustainable place. If there are enough farmers in the region joining the local food movement, could Duke University tap into this market? Thus the central objective for this study is to research the potential for creating a mutually beneficial relationship between local farmers and the university, and to do so through understanding both the producer side (local farmers) and the consumption side (university dining).

Objectives

The central question of this study is: what is the potential for creating connections between local food producers and Duke University dining services? As a secondary question, what are some potential mechanisms for making these connections? This study addresses the main question by looking at the structure and characteristics of the local food system near Duke, and by looking at the structure and characteristics of the dining system – and assumes that making such connections is a good idea. As an outgrowth of this research, the study addresses the second question by identifying recommendations that could help Duke take advantage of the local food producing resources that exist in the immediate area.

It is important to note that this project does not provide any cost-benefit analysis of the switching to local food choices. It also isn’t aimed at converting all of Duke’s food purchasing to local sources for a number of reasons. First, there may not be enough supply or enough diversity of products to satisfy all the students’ needs. Second, there is a seasonal aspect to the local food system that may inhibit fully implementing this type of system. Third, the barriers that currently exist (discussed in later sections) are such that some operators would be unwilling or unable to utilize these resources. The main impetus for pursuing a policy related to local purchasing is to increase the sustainability of Duke’s purchasing decisions by: (1) diversifying
food procurement to include local sources and (2) plugging local resources into the system where they are appropriate. Local food purchasing promotes sustainability through shorter distances between consumers and producers, smaller farm size and scale, utilizing local food purchasing venues, and by displaying a commitment to social and environmental dimensions of food production (Jarosz, 2008).

**Background**

In 2003, the Duke environmental sustainability coordinator initiated a study to determine the overall environmental impacts of the university dining system. The study, conducted by Greg Andeck, a Master’s of Environmental Management candidate in the Nicholas School of the Environment, identified significant impacts related to the university dining system, broken out into five broad categories: food ingredients, solid waste, chemical use, energy consumption, and consumer education. As a response to the recommendations put forth by the study, the Dining Director has incorporated environmental goals into the evaluation of dining operators, and broadly labeled sustainability as the third highest priority for the office (food temperature and hand sanitation were the top two opportunities). Local food purchasing policies are a specific aspect of sustainability in dining operations, and this study is designed to delve one step deeper, by focusing on the procurement of locally produced food for use in dining facilities.

To develop a comprehensive and coherent policy on local food procurement at the university, it is important to understand not only the current use of local food in the dining system, but also the current market for local products. As such, each section of this report will focus on both sides of this issue: production and consumption. Production sections will focus on sustainable agriculture, food system issues, and the methodology for measuring the local food market near Duke University. Consumption sections will focus on campus sustainability
movements, the dining services structure, and the current landscape of local food procurement at the university. Thinking about food systems in an integrated sense, connecting both production and consumption is utilized in the literature by Goodman (2002), Holloway (2007), and Selfa (2002). Producer-consumer relationships are highly visible in local food systems, and this research strives to evaluate these relationships in hopes of building this type of connection at Duke University.

**Context: Production**

The production section starts by providing a model for understanding the food system, defining the term sustainability, and then discussing both sustainable agriculture and sustainable food systems. The section ends with a discussion of the concept of local.

**Food System**

In order to better understand the producer – consumer relationships being studied, it is important to have an understanding of the systems in which they are rooted. The food system, at a basic level, is the system through which food is transferred from the field, to the plate of individuals eating that food. In reality, the system is much more complex, and a conceptual model is used here to better describe the different aspects of the system and how they fit together. The model consists of three subsystems: producer, consumer, and nutrition, each of which has inputs, transformation, and outputs (Sobal, Kettel Khan, & Bisogni, 1998). For example, in the producer subsystem production of crops occurs (including harvest), those crops are sent to a processor that alters the crop in some way or makes it marketable to consumers, and finally it is distributed to restaurants or supermarkets to feed into the consumer subsystem.
Table 1: Food and Nutrition System (Sobal et al., 1998)

<table>
<thead>
<tr>
<th>SUBSYSTEM</th>
<th>RESOURCE INPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer Subsystem</td>
<td>Production (input)</td>
</tr>
<tr>
<td></td>
<td>Processing (transformation)</td>
</tr>
<tr>
<td></td>
<td>Distribution (output)</td>
</tr>
<tr>
<td>Consumer Subsystem</td>
<td>Acquisition (input)</td>
</tr>
<tr>
<td></td>
<td>Preparation (transformation)</td>
</tr>
<tr>
<td></td>
<td>Consumption (output)</td>
</tr>
<tr>
<td>Nutrition Subsystem</td>
<td>Digestion (input)</td>
</tr>
<tr>
<td></td>
<td>Transport (transformation)</td>
</tr>
<tr>
<td></td>
<td>Utilization (output)</td>
</tr>
</tbody>
</table>

The model is linear in this form, but it also exists within the context of other biophysical and social systems, which provide feedback loops that help define the system (Sobal et al., 1998). Figure 1 shows the complete view of the food and nutrition system, with the three subsystems in
the middle, and biophysical and social systems influencing their functioning.

The conceptual model provides an overview of the food system, and describes the different pathways through the system. However, all food doesn’t travel through the food system in the same way, and four different routes represent the means through which consumers obtain food. The four routes are: the mainstream system, charitable assistance, federal food assistance, and the local food system (Pothukuchi, 2004). The mainstream, market-driven system is the dominant path, which is global in nature, energy-intensive, and increasingly consolidated (Feenstra, 2002). To fill in the gaps created by this system, charitable assistance (food banks and soup kitchens) and federal food assistance (food stamps, WIC, etc.) are two paths that provide food to those who cannot obtain it through the mainstream system (Pothukuchi, 2004). The fourth route is an alternative, rather than a complement, to the mainstream, and is referred to as the community food system (Pothukuchi, 2004). To put this into the context of a university, the university system takes advantage of the mainstream system and the local food system, so this study ignores the other two streams for the purpose of this project.

**Defining Sustainability**

In order to understand how local food systems can increase the sustainability of purchasing decisions at Duke, we first need to define sustainability. Discussions of sustainability invariably begin with the Brundtland Commission Report, *Our Common Future: Report of the World Commission on Environment and Development*, which defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Commission, 1987).” Though often criticized for being vague, it laid the groundwork for future work in the realm of sustainability. Soon after the Brundtland Report, Karl-Henrik Robert, a Swedish scientist, developed the Natural Step
Framework based on the principles of physics, as a way of defining sustainability scientifically. This definition of sustainability attempts to define sustainability in a more systematic way, and is the basis for how sustainability is applied in this study. After 22 iterations, sending his ideas to other scientists for peer review, he settled on four systems conditions for sustainability:

- Nature is not systematically increasing concentrations of substances extracted from the Earth’s crust,
- Nature is not systematically increasing concentrations of substances produced by society,
- Nature is not systematically increasing degradation by physical means, and
- People are not subject to conditions that undermine their capacity to meet their needs (www.naturalstep.org).

These systems conditions are the lens through which this study judges sustainability. As an example, traditional agriculture practices, as described in the literature, violate each one of these conditions in most situations. Heavy reliance on fossil fuels for the production of synthetic fertilizer and use in large farm equipment relates to the first condition. The use of synthetic fertilizers and pesticides at a rate far higher than Earth’s systems can absorb and break down these chemicals relates to the second condition. Tillage practices and other production factors lead to high rates of erosion and soil degradation, which relates to the third condition. Finally, the treatment of migrant farm workers in many areas of the US relates to the fourth condition.

*Sustainable Agriculture*

North Carolina has a diverse agricultural sector, and ranks in the top three in the US in production of tobacco, sweet potatoes, hogs, turkeys, and trout.¹ The agricultural sector provides $68.3 billion annually to the state’s economy, which is a substantial portion of the state’s income. However, the data provided by the state Department of Agriculture and Consumer Services paints an incomplete picture of the agricultural resources that exist in NC. In addition

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¹ All agricultural data for NC from: NC Dept. of Agriculture and Consumer Services, Agriculture Statistics Division. http://www.agr.state.nc.us/stats/index.htm
to commodity farming, 97 farmers’ markets were in operation in 2006, and over 50 community supported agriculture (CSA) programs were also in operation. Of the 54,000 farms identified in NC in 2002, 67% were less than 100 acres. These activities are a smaller portion of the overall agricultural sector, but they are a growing subsection supporting local food systems across the state. Purchasing local or organic food enhances local economies, encourages farmers to enter into new markets, and provides safe, healthy food grown. In that sense, it is a two-way street benefiting both farmers and consumers.

The direct costs of implementing a policy related to local purchasing masks the indirect costs of traditional food procurement policies. The modern industrial farming system is responsible for a number of environmental problems, which have been counter balanced with increasing agricultural yields (Horrigan, et al., 2002). The industrial system is generally concerned with producing the greatest yield per acre at the lowest cost. The emphasis on efficiency ignores the greater ecological systems in which farming is rooted, and the economic system allows industrial farms to ignore the externalities they create. Negative impacts through industrial farming include: contamination of soil and water, destruction of habitat, loss of genetic diversity, and a decrease in soil and water resources (Horrigan, et al., 2002). Increased reliance on chemical fertilizers and pesticides, which allow monoculture farming, are major contributors to the problem.

In response, sustainable agriculture principles have been developed as an alternative to the conventional model. The 1990 Farm Bill defines sustainable agriculture as: “An integrated system of plant and animal production practices having a site specific application that will, over the long-term: satisfy human food and fiber needs; enhance environmental quality and the natural resource base upon which the agriculture economy depends; make the most efficient use
of nonrenewable resources and integrate, where appropriate, natural biological cycles and controls; sustain the economic viability of farm/ranch operations; and enhance the quality of life for farmers/ ranchers and society as a whole (Title XVI, Subtitle A, Section 1603).”

The global agricultural landscape hosts a myriad of production techniques, and sustainability can be achieved in many different ways. For instance, many small farms use methods such as polyculture, crop rotation, low inputs, integrated pest management, biomimicry, etc. But while the methods of farming in a sustainable manner are varied, by understanding the four systems conditions of sustainability, the principles are simple:

- Strengthening the immune system of agricultural operations: stabilizing pests and nurturing natural pest control
- Decreasing toxicity in the system and environment through optimum use of external synthetic chemicals
- Optimizing metabolic functioning such as nutrient cycling and organic matter recycling
- Balancing regulatory systems – nutrient cycles, water balance, energy flows, population regulation
- Enhancing conservation and regeneration of soil and water resources and biodiversity
- Increasing and sustaining long-term productivity (Altieri, 2002).

One important trend in the NC agriculture sector, as well as in other parts of the US, is the consolidation of small and mid-size farms into larger industrial scale farms (personal communication, Cohn 2007). It is important to note that industrial scale farming isn’t the same as corporate owned farming, especially in North Carolina where the vast majority of farms are still family owned, even the large ones. Local food systems are helping to revitalize many small farmers, but the same markets don’t exist for mid-size farmers, which has led to an increased polarization between large and small farms. Institutional buyers, such as universities, are a new market for small farmers with the potential for providing a market for mid-size farmers as well. Currently, small farmers have been able to take advantage of small, local markets, but are
running into obstacles with larger markets, such as universities (Johnson & Stevenson, 1998; Strohbehn & Gregoire, 2004, Vogt & Kaiser, 2008). The growth of small farms, through the relationships developed at universities and other institutions, may work to revitalize mid-size farms.

*Sustainable Food Systems*

The concept of a sustainable food system is referred to in a number of different ways in the literature, as community food systems, alternative food networks, food sheds, and regenerative food systems (Pothukuchi, 2004; Jarosz, 2008; Kloppenburg, et al. 1996; and Dahlberg, 1993). In general, they share four characteristics: shorter distances between producers and consumers, small farm sizes, food purchasing venues (such as CSA’s, farmers’ markets, and cooperative markets), and a commitment to social and environmental goals (Jarosz, 2008). The different names highlight attributes that are similar as well: the sense that these systems are based in local communities; the idea that they are an alternative to the traditional food system; geographically-based elements are incorporated; and the systems are sustainable or regenerative. Implicit in the idea of sustainable food systems is the thought that the traditional global system is in many ways unsustainable (Grey, 2000; O’Hara & Stagl, 2001; La Trobe & Acott, 2000).

Other ideas of a sustainable food system are more geographically based. The concept of a food shed, similar to a watershed, helps reinforce the idea of proximity between producers and consumers by adding a natural or geographical element to procurement of food (Kloppenburg, et al., 2000). The distance between production of food and consumers, in the global system, has been shown to be vast. One Iowa study calculated food traveled 1,546 miles from conventional sources, as opposed to 44.6 miles from local food projects (Pirog, et al., 2001). A full life-cycle analysis of the greenhouse gas associated emissions from food production, though, finds that
transportation only accounts for 11% of greenhouse gas emissions, compared to 83% for the production phase (Weber & Matthews, 2008). In that sense, “food miles” may not be as important a factor as dietary choices, but proximity contributes to other positive factors in the system, for instance developing bonds between producers and consumers (Kloppenburg, 1996).

**Concepts of Local**

Defining the “local” in a sustainable food system can be difficult, and different groups within the same population may view proximity differently. In a study of producers and consumers in Washington State, differences were shown between producers and consumers within the same county, as well as between producers in different counties and consumers in different counties (Selfa & Qazi, 2005). Responses generally varied between proximity (miles travelled), county boundaries, and state boundaries. As an alternative to the global system, local is generally perceived in the literature as being good, although a number of authors have cautioned against this assumption (DuPuis & Goodman, 2005; Hinrichs, 2003; Born & Purcell, 2006). Both Dupuis (2005) and Hinrichs (2003) advocate a more critical analysis of the term, as it can lead to defensive politics in a region. It is also noted that local producers may or may not be more environmentally sustainable, and in many cases, the limits of local may need to be expanded to fulfill nutritional needs of certain populations (Hinrichs, 2003). Lastly, Born (2006) identifies “the local trap” (assuming local is preferable to global), by defining scale as being socially produced. Since scale is a social development, food produced at a local scale is no more likely to be sustainable than food produced in a global system. These concepts of local in the literature aren’t arguments against the benefits of a local food system, but rather arguments that the idea of local needs to be more carefully considered.
A 2010 study of local food systems by the USDA Economic Research Service provides the most recent review of the definition and characteristics of the local food systems. The highlighted findings include (Martinez, et al. 2010):

- There is still no generally accepted definition of the term “local.” As an example of the range of definitions, the 2008 Farm Act defines a local food product as being less than 400 miles from its origin, or within the state it was produced.
- Local food markets account for a growing portion of total US agricultural sales. Direct-to-consumer sales accounted for 0.8 percent of sales in 2007.
- Local food systems are more likely to occur where there are small farms located near metropolitan counties.
- Consumers are willing to pay more for locally produced food.
- Governments at all levels are increasingly supporting local food systems.

**Context: Consumption**

The consumption section starts off with a discussion of broader campus sustainability, and then focuses on the duke dining system, the associated PACE scoring system utilized by dining services, and how sustainability fits into the PACE system. Lastly, this section finishes with an overview of farm-to-school movements at other universities.

*Campus Sustainability Movement*

Three years after the Brundtland Commission Report, and two years before the Earth Summit in Rio, a group of university leaders met and signed the Talloires Declaration, in Talloires, France (Bartlett and Chase, 2004). Twenty university leaders from around the world signed the original document, and today over 350 university leaders have signed on (Duke is not one of the current signatories). The declaration states that environmental degradation is occurring all over the world and that, “universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible (USLF, 1990).” The declaration set forth ten goals:
• Increase awareness of environmentally sustainable development
• Create an institutional culture of sustainability
• Educate for environmentally responsible citizenship
• Foster environmental literacy for all
• Practice institutional ecology
• Involve all stakeholders
• Collaborate for interdisciplinary approaches
• Enhance capacity of primary and secondary schools
• Broaden service and outreach nationally and internationally
• Maintain the movement (USLF, 1990)

The Sustainable Endowments Institute releases a College Sustainability Report Card every year, and in 2008, Duke received a B+ overall, and an A under the category Food and Recycling (Sustainability Endowment Institute, 2008). Duke receives credit for its recycling program, as well as Bon Appetit’s efforts to purchase local food.

*Dining History*

Prior to 1997, Duke Dining Services managed all 18 union-run dining facilities on campus with approximately $14 million in revenue annually. During that time, Jim Wulforst was managing dining operations for Time Magazine in New York City, and subsequently for Time Warner after the merger. Wulforst brought his experience and expertise to Duke in 1997, and has worked tirelessly to improve operations since that time. Today, all of Duke’s eateries are operated as private contracts with approximately $30 million in revenue annually. The transition from union to privatization occurred without cutting any food-service jobs and currently consists of approximately 32 locations with 16 contracts. Layoffs were avoided during the transition by reassigning workers to other union supported jobs on campus (e.g., grounds and

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2 The history of the Duke Dining system is based on a personal communication with Jim Wulforst, Director of Dining Services, October 19, 2007.
maintenance, custodial services, etc). The largest contract is held by Bon Appetit, part of The Compass Group, which manages the Great Hall, Chick-fil-A, Subway, the Freeman Center, Trinity Cafe, and the East Campus Marketplace. Bon Appetit maintains the remaining union-employees managed under the Local 77 contract at all locations. The contract model for dining services has helped diversify menus, accommodate popular chains (McDonalds, Chick-fil-A, etc.), and allowed Wulforst to work with independent businesses with a passion for service. Dining services also oversees 13 off-campus vendors, which provide delivery services to campus.

Table 2: Dining Service Characteristics (per. comm., Wulforst, 2007)

<table>
<thead>
<tr>
<th>Duke Dining Services Facts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of eateries?</td>
<td>32 eateries</td>
</tr>
<tr>
<td>Concessions?</td>
<td>All are private concessions</td>
</tr>
<tr>
<td>How many meals a year?</td>
<td>3.3 million</td>
</tr>
<tr>
<td>Annual revenue?</td>
<td>$30 million</td>
</tr>
<tr>
<td>Types of eateries?</td>
<td></td>
</tr>
<tr>
<td>Restaurants</td>
<td>6</td>
</tr>
<tr>
<td>Mobile Carts</td>
<td>6</td>
</tr>
<tr>
<td>Coffee Shops</td>
<td>5</td>
</tr>
<tr>
<td>Cafés</td>
<td>4</td>
</tr>
<tr>
<td>Franchises</td>
<td>4</td>
</tr>
<tr>
<td>Cafeterias</td>
<td>4</td>
</tr>
<tr>
<td>Delis</td>
<td>2</td>
</tr>
<tr>
<td>Juice Shops</td>
<td>1</td>
</tr>
</tbody>
</table>

| Types of concessioners*                        |   |
| Local/family business                          | 11 |
| Local franchisers                              | 5 |
| Multinational foodservice management company   | 1 |

* Some concessioners operate multiple eateries.
PACE Program

The PACE (Performance Assessment for Culinary Excellence) Program is an evaluation system used by dining services to evaluate vendors on a fixed performance scale. Wolforst conceived the program during a tour of Air Force facilities overseas, and based it on a system used by the Air Force to evaluate its bases (per. comm., Wulforst, 2007). The program, instituted in 2003, uses four main components to identify the strengths and weaknesses of each vendor (per. comm., Wulforst, 2007):

- Operational performance review - audit of five main categories: kitchen operations, serving and dining operations, personnel, sanitation and maintenance, and management.
- Customer care review - three “mystery shoppers” and one senior staff assessing the customer experience.
- Periodic review of operations - pared down variation of the operational review.
- Student committee quality review - similar to the customer care review.

The operational performance review is the backbone of the program, and is performed once a year. Based largely on this review, and buttressed by the two separate customer care reviews, each operation receives a numerical score on a scale from 1 to 1000. At the end of each year, approximately $60,000 in performance incentives are handed out based on the scoring system, with awards for best facility, sustained excellence, and continued improvement. Incentive can include awards and/or funds designated for new equipment/upgrades. The standards are updated annually and weigh heavily in contract renewals. The points breaks down like so, in order of weight: sanitation & maintance-275, serving & dining-225, personnel-175, management-175, and kitchen operations-150. As expected, cleanliness is the most important category, followed by the dining experience provided by the operator.

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PACE and Sustainability

The forming of the Ad Hoc Committee on Green Dining, and the addition of a green dining position has led to more focused efforts in sustainability. On a list of opportunities currently being pursued by Dining Services, greening initiatives are ranked third in a list of ten by importance (food temperature and hand sanitation were the top two opportunities). Listed under greening initiatives on the Dining Services list of opportunities, they have identified four initiatives: composting, recycling, unbleached napkins, and purchasing local and organic. Connecting this back to the PACE Program, the scoring system lists “greening” as a category under management, and currently is allotted 55 points out of 1000 – that number has actually decreased. The greening category addresses a number of options: recycling/composting-30, containers-5, unbleached napkins-7, organic ingredients-3, lights-5, and water conservation-5.

The connection between PACE and sustainability is important for a number of reasons. First, all four initiatives identified under opportunities are being pursued except for incentives for purchasing local (local and organic aren’t the same things). This is important because dining services has listed “buying local” as a top three opportunity, yet they haven’t incorporated it into the scoring system. Second, although greening initiatives are addressed, they currently make up only 5% of the program. This is important for this study as the recommendations make the case for increasing this share in the future. Third, the PACE program has a design that lends itself toward implementing sustainability. Much of the work in corporate sustainability is focused on developing metrics, similar to the set of metrics in the PACE program, for measuring and documenting sustainability.

Local buying programs at colleges and universities are generally referred to as farm-to-college programs. The moniker is also used more broadly as farm-to-institution, and is derived from the more popular farm-to-school programs that exist around the country at public and private K-12 institutions (Vogt, 2008). Farm-to-school programs are more widespread, relatively successful, in many cases supported by government funding, and have served as a model for farm-to-college programs. Colleges and universities have many advantages public school systems don’t have, such as greater funding for food services, customers (students) exerting more influence, and kitchens with staff qualified to prepare fresh food, all of which are lacking in many school systems (Vallianatos et al., 2004). On the other hand, colleges and universities are in many ways run like a business, which requires a return on investment for many of its costs. Not only are direct costs for purchasing local products higher than traditional procurement (which is generally the lowest cost alternative by design) but increased transaction costs occur through interactions with multiple farmers rather than one distributor (Vogt, 2008).

In general, farm-to-institution programs are designed to connect farmers or already existing farmer organizations with schools, colleges, or other institutions (hospitals, prisons, etc.) that require a relatively steady supply of food on a yearly basis. The programs suffer from many of the same obstacles, but remain popular due to the vast opportunities, or perceived opportunities that exist. In one respect, the greatest opportunity stems from the fact that many of these institutions are spending billions of dollars a year on food, a portion of which could be rerouted to local purchases. Another perceived opportunity is the plight of the small American farmer looking for an outlet for his goods. Both ideas are true, although they aren’t that simple, and the benefits don’t always match up. For instance, not all institutions are designed to be able
to accept fresh, unprocessed food, and many small farmers aren’t set up to accommodate the many requirements of larger institutions.

The National Farm to College Program is maintained by the Community Food Security Coalition (CFSC), a non-profit committed to expanding and supporting local food systems in communities across the US. According to data reported by the CFSC, there were approximately 125 schools in the US managing farm-to-college type programs in 2005 (CFSC, 2008). Programs range from small purchases for special event type catering to larger, more established programs that provide locally sourced food in cafeterias daily. The data collected through their survey are not exhaustive by any means (data were collected through a voluntary survey of individuals who have visited their website), but it provides anecdotal evidence to support the claim that these programs are gaining prominence within university systems. Two food service companies, Bon Appetit and Parkhurst Dining, also provided data on their contributions to local sourcing for universities. Bon Appetit is the largest food service contractor at Duke University.

**Methods**

This study utilizes two main methods for collecting data: a farm based survey, and interviews with dining operators. The production survey utilized in this study is designed to do two main things: first, develop a baseline understanding of the state of local food production in the region, and second, analyze what markets are currently being served in the local food system.

In order to think about policies aimed at helping farmers, it is important to understand their current situation. The dining manager interviews (consumer side), are designed to develop a baseline understanding of the connections that already exist between the dining operations and local farmers. By connecting the current state of the local market with the current relationships that already exist, one can better develop and relate policies aimed at benefitting both groups.
These results lead to the final section, which provides recommendations to further develop the bond between local farmers and dining operators.

**Production: Farmer Survey**

In order to evaluate the characteristics of the current local food system in the Durham area, this study uses a farmer survey to assess where farmers are currently marketing products, what products are being marketed, and future opportunities for marketing. The survey (Appendix A), contained 18 questions eliciting background information, market information, and production techniques. Background information was used to get a baseline for the sample and describe the group of farmers participating in the local food system. Questions covered physical make-up of the farm, location, income, age, gender, type of products and percentage of each product. Market information was used to understand current and future marketing opportunities, as well as marketing phrases used to distinguish products. Lastly, information on production techniques was used to understand what farmers’ perceptions of sustainable farming are at an individual level.

The survey was hand delivered and in most cases returned the same day as administered. The purpose of this technique was to insure a high percentage of respondents returning the survey. Since the sample size of small farmers participating in the local food system is already relatively limited, especially in the geographic area under study, it was important to take measures to ensure an appropriate sample of farmers were surveyed. Small farmers, by nature, are a busy population demographic, as they are generally performing much of the farm work without a lot of help. In addition, small farmers tend to be harder to identify, as many do not have websites, which ruled out internet and e-mail techniques. Telephone and mail survey’s techniques were also considered, but due to constraints on time and ensuring a high response
rate, in person delivery of surveys was used. Farmers’ markets are a centralized place where small farmers participating in the local food system gather, two criteria important for the survey; and so it was decided to be an appropriate venue for making contact.

By choosing this sampling method, a number of limitations were placed on the data, and a number of biases were introduced. For instance, the farmers at the market may not be entirely representative of the small farming community in the Durham area. The trade-off is they all are participating in the local food system, by nature of participating in the market. Farmers’ markets are a popular place for farmers to connect with customers and are a mainstay of the local food system. Since 100% of the sample is using the farmers’ market to market their products to consumers, the survey assesses markets for products in addition to the farmers’ market. Another important piece of the puzzle for the assessment was the opportunities farmers were interested in pursuing in the future.

Four farmers’ markets were chosen as sites to administer the survey, based on their physical proximity to the Duke University Campus.

- Durham Farmers’ Market: 501 Foster Street, Durham, NC 27701
  - Survey Administered: July 19, 2008
  - Distance from Duke: 2.5 miles
  - Farms no more than 70 miles away
- Carrboro Farmers’ Market: 301 W. Main Street, Carrboro, NC 27510
  - Survey Administered: August 13, 2008
  - Distance from Duke: 14.6 miles
  - Farms no more than 50 miles away
- Orange County Farmers’ Market: 306 E. Revere Road, Hillsborough, NC 27278
Consumption: Dining Interviews

In order to evaluate the current use of local food in the dining system, the study employed interviews of dining operators on campus that could potentially incorporate local food resources into their operation. Interviews were conducted over the phone, with support from the Duke Dining Director. Of the 32 “eateries” on campus, operations that are under the control of Dining Services, ten interviews were conducted based on one criterion: the ability to utilize local food in the operation. The study assumes that not all operations were able to utilize locally purchased goods, e.g. coffee and bagel shops, McDonalds, etc. The number of interviews hides the fact that some owners have multiple operations on campus. For instance, the Alpine Atrium, Alpine Bagels, and Alpine Café all share the same owner, and as such, share similar purchasing policies. The Compass Group, whose company Bon Appétit is the largest food contractor on campus, operates The Marketplace, The Great Hall, The Freeman Center for Jewish Life, Chick-fil-A, Subway, and Trinity Café, which makes up almost 80% of the total annual food budget at Duke. The interesting thing about Bon Appétit is that certain operations utilize local purchasing, while the traditional chain operations under their control do not (i.e., Subway and Chick-fil-A). Other
establishments that do not serve food, such as the Duke Coffeehouse and Quenchers were not interviewed as likely candidates because they do not serve prepared foods at those operations.

The interviews of the dining managers were based on the same set of questions. Rather than a strict survey though, I wanted owners/managers to be able to elaborate on their purchasing policies as they saw fit, and as the conversation allowed. The purpose of the interview was to gain knowledge into the amount of local purchasing taking place, as well as the perceived barriers to purchasing locally for food managers. The interview focused on the barriers to local purchasing identified by Johnson and Stevenson (1998). This study focuses on sustainable agriculture products in university food service operations, highlights a number of programs around the country, and illuminates many of the opportunities and barriers facing farm-to-college programs. Barriers identified at universities included: prices, convenience of one stop shopping, liability, labor, storage, and commitments (Johnson & Stevenson, 1998). The study looked at a sample of universities incorporating local food and found four approaches being used: offering certified organic, offering food directly from a few small farms, offering local food theme menus, and offering local food from the industrial distribution system (Johnson & Stevenson, 1998).

Table 3: Common Requirements for Procurement at Universities (Johnson and Stevenson, 1998)
One observation of note is that the interviews of establishments that used locally sourced products in their operations were more extensive than those that had not, because they were more aware of the system, and more able to elaborate on the questions directed for the study. As such, the discussion of barriers in the system is biased toward operators who utilized local purchasing policies because they were better able to discuss the issues.

**Results: Production**

In order to survey the local food system in the Durham area, 29 surveys were handed out at the Durham Farmers’ Market, with 22 surveys completed; 18 surveys were handed out at the Carrboro Farmers’ market, with 15 surveys completed; 11 surveys were handed out at the Hillsborough Farmers’ market, with 8 surveys completed; and 7 surveys were handed out at the Orange County Farmers’ market, with 5 surveys completed. A total of 65 surveys were administered at the four farmers’ markets, and 50 were completed for a 77% response rate. Those farmers who choose not to participate in the survey stated two main reasons for not returning the survey: (1) they did not have time to complete the survey during the length of the market (either due to being busy, or being uninterested in completing another survey), or (2) they felt they could not provide all of the requested information and hence chose not to answer any questions.

The median farm size for the sample was 30 acres, with a range of .3 to 1100 acres. A number of large farms focusing on livestock skew the mean farm size of the population, which is why the median is reported. The median cultivated acres were 6 acres, with a range of .25 to 800 acres. The large range of farm sizes is explained by the types of farms, and the methods of farming. The eight largest farms surveyed were farms that utilized grazing techniques for cattle, bison, goat, sheep, and/or pigs (in their case, cultivated meant grazed). Of the 50 farmers
surveyed, 44 owned part or all of the land under production, while 6 were under leasing agreements. One farmer, who grazed different types of livestock, owned part of the land and leased the other part. The farms had been utilized by the current farmer for a mean of 17 years, ranging from 1 to 40 years.

Figure 2

The four farmers’ markets were populated by a relatively diverse set of farmers. The mean age of farmers was 47 years old, ranging from 17 to 65. Of the respondents, 43% were female and 57% were male. In addition, most farms marketed a diverse number of products. Fruits and vegetables were the highest frequency products found at the market, but most farms sold products from multiple product classes. Product categories were: beef, pork, poultry, eggs, dairy, produce, fruits, and other. Responses for others included: flowers, herbs, honey, tobacco, goats, sheep, prawns, and hay. Of the 50 respondents, only eight farms focused on one product: one of which was bison, and another was beeswax (both were the only vendors marketing these products at the market). The other six farms focused strictly on vegetables. The mean number of product classes being marketed was 2.70, ranging from 1 to 6. Nine farms primarily marketed 1 product, eighteen farms marketed 2, twelve farms marketed 3, seven farms marketed 4, two
farms marketed 5, and one farm marketed 6. The farms that marketed four products or greater generally had fruits and vegetables with some combination of meat or eggs as well.

**Figure 3**

![Frequency of Individual Products](chart1)

An attempt was made at quantifying the percentage of income that was derived from each product. Of those vegetable producers who responded to that particular question, 66.67% of produce farmers, vegetables made up 66.25% of total farm income. Produce was the most commonly marketed product, and it was also a high proportion of the farmer’s total income. Of

**Figure 4**

![Frequency of Products Marketed](chart2)
those beef producers who responded to the question, 57% of beef farmers, beef made up 72.5% of total farm income. Those farms that focused on raising steer, tended to rely mainly on beef for on-farm income, which is likely due to the amount of effort that goes into maintaining a herd of cows. Of those pork farmers who responded to the question, 40% of pork farmers, pork made up 12.5% of total farm income. Pork farmers generally had a diverse set of products contributing to total on-farm income. Of those poultry farmers who responded to the question, 37.5% of poultry farmers, poultry made up 36.7% of total on-farm income. Of those egg farmers who responded to the question, 61.1% of egg farmers, eggs made up only 7.9% of total on-farm income, which suggests eggs were a source of side income rather than a main source of income. Of those dairy farmers who responded to the question, 100% of dairy farmers, dairy contributed 97.5% of total on-farm income. The dairy farm result is consistent with the beef farm result, as managing a herd of dairy cows requires a substantial effort. Of those fruit farmers who responded to the question, 61.5% of fruit farmers, fruit contributed 25.65% of income, and was generally paired up with vegetable farms. Those farmers that raised both fruit and vegetables derived a larger percentage of income from the latter. Lastly, those farmers’ marketing other products who responded to the question, 66.67% of farmers, the other category represented 39.6% of total on farm income. Table 4 and Figure 5 summarize this information.

Table 4: Percentage of Total Farm Income

<table>
<thead>
<tr>
<th>Item (# of respondents)</th>
<th>% of respondents</th>
<th>% of Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef (4)</td>
<td>57.1</td>
<td>72.5</td>
</tr>
<tr>
<td>Pork (2)</td>
<td>40.0</td>
<td>12.5</td>
</tr>
<tr>
<td>Poultry (3)</td>
<td>37.5</td>
<td>26.7</td>
</tr>
<tr>
<td>Eggs (11)</td>
<td>61.1</td>
<td>7.9</td>
</tr>
<tr>
<td>Dairy (2)</td>
<td>100.0</td>
<td>97.5</td>
</tr>
<tr>
<td>Produce (28)</td>
<td>66.7</td>
<td>66.3</td>
</tr>
<tr>
<td>Fruit (16)</td>
<td>61.5</td>
<td>25.7</td>
</tr>
<tr>
<td>Other (16)</td>
<td>66.7</td>
<td>39.6</td>
</tr>
</tbody>
</table>
Total on farm income was also estimated by providing eleven income ranges to choose from starting with less than $5,000 and ending with over $200,000. Figure 6 summarizes the income data. The two largest categories were $25,000-$34,999 (27%) and <$5,000 (22%). The data varied greatly between farmers’ markets: Durham Farmers’ market farmers had the highest income frequency in the category $50,000-$74,999; Carrboro Farmers’ market farmers had the highest income frequency in the category $25,000-$34,999; Hillsborough Farmers’ market farmers had the highest income frequency in the category >$5,000; and the Orange County Farmers’ market farmers had more in the lower income ranges than higher income ranges. Interestingly enough, Hillsborough and Orange County Markets had the highest frequency of farmers with off-farm income, with 100% and 71.4% respectively. The Durham and Carrboro Markets farmers had off-farm income frequencies of 21.4% and 46.2% respectively. The data suggest that while Hillsborough and Orange County farmers had less on farm income, they made up for this with more off-farm income. Farmers at the Durham and Carrboro Markets seem to rely more heavily on their on-farm income as the greatest portion of their total.
Each farmer surveyed participated in the farmers’ market, which as described in the methods, was used as a technique designed to increase the survey response rate. Seven farmers surveyed used the farmers’ market as the sole market for their products. Fourteen farmers also participated in a Community Supported Agriculture (CSA) program, twelve farmers’ marketed to restaurants, fourteen sold products directly from the farm, ten used retail outlets, five farms used a distributor, six used specialty stores, and one each used a website or cooperative. The survey also elicited information regarding the percentage of income derived from each market, although the data were inconsistent and difficult to compare. Anecdotally, based on those respondents who provided this information, the majority derived 50% of more of their farm income from the farmers’ market, and much less from other markets. This suggests that while farmers are indeed branching out into new markets and developing new customer relationships, the farmers’ market is still a vital aspect of the local food system. The data also shows that only twelve farmers were currently utilizing restaurants as a market for their products, which suggests there could be future potential for utilizing this opportunity.
Two last important pieces of data were collected in the survey: first, the farming techniques that related to sustainability, and second, the terms used to market their products. Each was open ended, and they were designed to compare what farmers were doing in the field, and how they chose to elucidate that information to the consumer. The farmers identified a host of techniques physically being used in the production of crops, but by far the most common answer (25 responses) related to either crop rotation (in relation to plants) or rotational grazing (in relation to animals). The idea of rotation lends itself to sustainability as a way of letting the land heal by not overtaxing the resources of the soil and its nutrients. Other popular responses were: cover crops (13), organic (9), integrated pest management (6), green manure (5), compost (5), and low inputs (5). Most importantly, 32 farms named more than one production technique, which suggests that small farmers participating in the food system are utilizing multiple techniques to address sustainability. This question addresses the “local trap” (assuming local is preferable to global) by allowing the farmers to define what is sustainable, and how they choose to address concepts of sustainability in their farming.
The largest range of responses from farmers came from the question related to terms used to market products. The farmers identified 14 different marketing terms, and the majority of those who responded to the question, 85%, used more than one term to describe their operation. Half the terms used describe some sort of specific production techniques, or on farm policies, and the other half of the marketing terms are more broad impressions of farming. Of those farmers who responded with multiple marketing terms, approximately half used a combination of broad and detailed terms, while the other half used either broad or detailed terms.

**Table 5: Marketing Terms**

<table>
<thead>
<tr>
<th>Marketing Terms</th>
<th>Broad</th>
<th>Detailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local (23)</td>
<td>Free Range (10)</td>
<td></td>
</tr>
<tr>
<td>Sustainable (11)</td>
<td>Pesticide Free (7)</td>
<td></td>
</tr>
<tr>
<td>Organic (7)</td>
<td>Pasture Raised (4)</td>
<td></td>
</tr>
<tr>
<td>Fresh (4)</td>
<td>Antibiotic Free (2)</td>
<td></td>
</tr>
<tr>
<td>Homestead (3)</td>
<td>Grass Fed (4)</td>
<td></td>
</tr>
<tr>
<td>Natural (9)</td>
<td>No rBGH (2)</td>
<td></td>
</tr>
<tr>
<td>Healthy (2)</td>
<td>Heirloom (2)</td>
<td></td>
</tr>
</tbody>
</table>

The figure above shows the frequency of production techniques used by farmers. The techniques range from crop rotation, polyculture, raised beds, compost, to drip irrigation, passive solar, and no till. The highest frequency is observed for crop rotation, followed by polyculture, compost, and raised beds.
Results: Consumption

Bon Appétit

Bon Appétit Management Company (Bon Appétit) is owned by the Compass Group and is the largest food contractor on campus. As stated earlier, they operate The Marketplace and Trinity Café on East Campus, and The Great Hall, The Freeman Center for Jewish Studies, Subway, and Chic-fil-A on West Campus. Figure 9 shows the locations of those purchases: honey from Chapel Hill, beef from Pinetop, dairy from Siler city, and produce from Eastern Carolina Organics (ECO). It should be noted that ECO, while labeled as Pittsboro, is a food marketing cooperative that sources produce from all over the state. In addition to purchasing locally, the food service company addressed sustainability through: adjusting menus seasonally, educating students, buying cage free eggs, hormone free beef and poultry, 100% grass fed beef, and using Monterrey Bay Aquarium seafood guidelines. Bon Appetit replaced another food service company at Duke, Aramark, in 2005. They are highly regarded within the industry for their commitment to social responsibility, and they manage dining services at other universities and companies around the country including: Wesleyan University, MIT, Cisco Systems, and Oracle Corporation.

Figure 9: Locations of Local Purchases by Bon Appetit
Bon Appétit sponsors an “Eat Local Challenge” that requires chefs at its cafes all around the country to create a meal entirely sourced within 150 miles of the campus. The program is part of Bon Appétit’s Farm-to-Fork program and their Circle of Responsibility. The Circle of Responsibility is a corporate level program that takes into account environment, community and well-being. According to the Circle of Responsibility website, Bon Appetit pursues local purchasing for three reasons: flavor (food that is grown locally is fresher), environment (impacts associated with transportation), and community (supporting agricultural heritage).

The benefits of local food procurement and sustainability policies do not carry over into the franchises under the control of the company. Bon Appetit pays franchising rights to Subway and Chic-fil-A in order to run these operations at Duke. As such, these two dining establishments have their own sourcing guidelines and procurement policies, which need to be abided by. Any customer going into a Subway or Chic-fil-A expects a level of consistency in the operations that leaves little room for diverse suppliers based on product specifications set forth by each company. Each company has their own supply chain policies designated in the franchising agreement, which are followed by the individual store managers.

Refectory

The Refectory at Duke’s Divinity School is making significant strides toward sustainability, and is the leading local food purchaser at Duke. The dining establishment is owned and operated by Laura Hall, and is a prime example of Dining Services working with talented owners to provide a unique dining experience at the university. Local content has to be at least 35%, although it averages 50% and can reach up to 70% in the summer. Of a total 50 suppliers being used by the operation, 32 suppliers, or 64% are considered local by the owner. Over the course of the year, a total of 54% of total purchases were made through local farms of
vendors. Local purchasing is also diverse in the method of procurement. Some farmers deliver goods directly to the restaurant, other products occasionally may be picked up by the owner (or manager), and trips are also made to the farmers’ market to round out procurement, especially in the summer. The owners stress “sustainable” over “organic,” although they do generally serve approximately 20% organic ingredients. Organic is a federally defined term, which is regulated by the USDA, whereas sustainable, in this context, is a broader definition of food that may include organic, but focuses more on whether the food is local and the individual production practices of farmers that promote sustainability. Local purchasing encompasses produce, meat, dairy, and free-range eggs. Other aspects of sustainability include: educating students, adjusting their menu seasonally, and cooking from scratch while eschewing processed foods. The Refectory is expanding on Duke’s campus next year as the operator of the cafeteria at the Duke Law School.

**Saladelia**

The Perk at Bostock Library is a café, which is operated by Saladelia, a Durham based company that has its main café location on University Drive. The café serves coffee, soups, salads, and sandwiches. The company currently has six local suppliers that provide just fewer than 30% of total purchases. The two largest product classes sourced locally are produce and eggs. In addition to local purchasing, the company addresses concerns over sustainability through hormone and antibiotic free meat, wild caught seafood, fair trade coffee, and educating consumers. Saladelia has developed reciprocal relationships with farmers as well, by sending compostable food scraps to a local farm for composting.
Nasher

The Nasher Café is owned and operated by Giorgios Hospitality Group, a company that operates six other restaurants in the Durham area. The café uses 13 local food suppliers for meat, eggs, and vegetables, as well as two other local suppliers of baked goods. While I am still waiting for individual numbers from the manager on the percentage of total purchases, the companies focus on fresh ingredients lends itself well to the local food system. Restaurants operated by Giorgios Hospitality Group are generally more upscale, sit-down establishments, and the Nasher is no different. Providing a higher level of service allows the company to pass any extra costs of procurement on to the consumer.

Tommy’s

Tommy’s Rubs, Grubs, and Suds is a southern barbeque restaurant located in McClendon Tower, owned by Tom Meyer and Managed by David Dennis. The dining establishment features locally sourced pork and chicken in their barbeque menu, as well as sweet potatoes and other locally grown produce. As a traditional North Carolina barbeque restaurant, it is important to get the style right, but also to use as many ingredients from the state as possible. This provides the customers with a more complete dining experience.

Faculty Commons

The Faculty Commons is owned and operated by Sage and Swift Catering Company, which is a Durham-based catering company that also operates Watts Grocery on Broad Street. The establishment is designed as a place where students and faculty can sit together in order to foster a greater dialogue between the two groups. By using locally sourced ingredients, the establishment is connecting customers with farmers as well, and it has a staff that truly seems excited about the food buying policies.
Other Operators

The remaining dining operators interviewed on campus had no local purchasing policies. Most establishments used US Foodservice, which is one of the largest foodservice distributors in the country. Interviews with these operators were generally shorter and less informative than those conversations with other operators for a couple of reasons. First, by having a reliable food supplier in place that provided for the establishments needs, managers were content with the service provided. Second, by using one supplier, they generally had less knowledge of where the food was coming from. Finally, by having less knowledge of the local food system and relationships with diverse suppliers, they weren’t as able to speak to the barriers of such a system. Those operators who did source local products were able to speak more constructively about the system, and the employees of the establishments usually were also well versed in the purchasing habits of the owners.

Discussion: Production

Survey Implications

Survey respondents were instructed to skip any questions they didn’t want to answer and stop participating in the survey at any time as they felt comfortable. Some respondents heeded this advice and chose to skip questions, or stopped the survey half-way through. Of the 50 respondents, five refused to answer a substantial portion of the survey. The resulting responses were enlightening, but consistent information across each question would have been beneficial. In addition, while most respondents related the types of products being sold, far fewer respondents related the relative percentages of each product. A number of explanations may be found for these inconsistencies, some relating to the distribution technique, and some related to the survey itself. For instance, farmers’ markets are relatively busy, due to the short time frame
(4 hours) and frequency of occurrence (twice per week), which may have affected the answers provided. Additionally, a few surveys were only filled out on one side, which means some respondents either forgot or were too busy to complete the whole survey.

One issue that was raised by multiple farmers, which unfortunately was not picked up under any of the survey questions, was the fact that a number of farmers were unable to keep up with current demand for their products. During the explanation of survey goals, at the beginning of administering the survey, was usually when this information was related to the investigator. This has major implications for the consumer, as well as for the markets that farmers can access. It is an obvious statement, but a very important one: farmers can only sell what they harvest, and consumers can only buy what harvest is available every year. The local food system, as shown in the survey results, is made up of relatively small farms. In order to serve all the existing markets, one of two things must happen: current farmers need to expand production, or more farmers are needed to satisfy demand. Looking ahead to the consumption discussion, this issue is going to have major consequences for food service managers looking to develop relationships with farmers. Building connections between farmers and food service managers is going to be vital if managers are going to be able to take advantage of limited supplies.

Another consequence of the local food system, as it is described by the survey, is that food service managers may need to expand the term local in order to meet their demand requirements. For instance, Bon Appetit uses Eastern Carolina Organics (ECO) as a produce supplier for its kitchens, and ECO uses farmers from all over North Carolina as suppliers. ECO is a food marketing and distribution cooperative based in Pittsboro. The question then becomes: how do we define local? For this study, a geographical boundary wasn’t set to determine local from not local, as it was assumed that if farmers were able to service the local farmers’ market,
they would be able to service other vendors in the Durham area. It is also beyond the scope of this research to define, in a strict manner, what the appropriate meaning of local should be for dining operators at Duke. In this sense, producers and consumers are on a similar footing: both are looking for options that are broadly thought of as sustainable, rather than a strict sense of food miles. This seems logical, because sustainability, as defined earlier in the paper, is based on a set of principles and not a prescribed set of techniques.

**Discussion: Consumption**

The study conducted by Johnson and Stevenson (1998) at the University of Wisconsin-Madison identified a number of barriers to instituting local food purchasing policies. During interviews for this study, managers were asked to identify the barriers that they saw as influencing the decision to purchase local products. The six categories of barriers identified by Johnson and Stevenson were: current system, price, one-stop shopping, risk, and commitments. In the course of conducting interviews of campus operators, this study identified one other barrier to purchasing locally: availability. Using these categories, operators demonstrated how they each viewed the local food system, and how that connected to their buying habits.

**Current System**

The current system argument was the single most common argument made by operators not purchasing locally, and in every case, it was the main barrier identified. Operators that have a reliable supplier generally don’t see the need to expand beyond that, as long as their needs are satisfied. The implication of this barrier is that any recommendations need to be focused on addressing and overcoming this barrier over the others. Laura Hall, the owner of the Refectory, also identified this barrier as an important factor. She was aware of the complications of getting involved in the system, as well as the extra resources needed to manage multiple suppliers.
Working with farmers entails building relationships, and those establishments that work with US Foodservice or any other of the large suppliers, already have a relationship with that company.

The process of branching out requires more management and resources than some companies are willing to spend. The next section focuses on the barrier of price, but one barrier that is implicit in the current system argument is the idea of transaction costs. It takes time and effort to build the types of relationships described in this analysis. The time and effort is an additional cost to the operator beyond the unit price, but that is incurred by the operator before he or she can take advantage of local sourcing. The recommendations discussed later are focused on addressing this fundamental barrier.

**Price**

Dining establishments on campus are essentially independent operators, which provide a commission to the Dining Services office in order to conduct business on campus. In that capacity, operators have to be keenly aware of the bottom line in order to stay profitable at their locations. Ironically, price was only mentioned by one operator as a barrier to buying local products. Although it wasn’t identified as the main barrier by many of the operators, this is more likely a function of other barriers being more important than price, rather than price not being an issue. The important point that came from talking with Saladelia and Bon Appétit about the price barrier is that price only becomes a factor when thinking about purchasing in narrow terms. For most companies that purchase locally (and this came up many times in the discussions), there was a mutual benefit to both the operator and the farmer. Thinking more broadly about price in this context, both operators said that it was important to work with the farmers on finding a price that was beneficial to both parties. By spending that extra effort to work with the farmers,
especially within the context of building relationships, the importance of price in many cases decreased.

**One-Stop Shopping**

The crux of the one-stop shopping argument is that it is easier to get products from one supplier than it is to get products from multiple suppliers. The extra time involved in managing multiple suppliers was brought up by both The Refectory and Saladelia. These two operators are interesting because The Refectory has thirty plus suppliers, and Saladelia has six suppliers. Laura Hall mentioned that time management was a reason she felt other operators may be unwilling to source locally, and Saladelia provided it as a reason it did not purchase more locally. In the case of the Refectory, Hall enjoys the challenge of managing a large number of suppliers, and her commitment to sustainability is built into the vision of her restaurant. The vision and goals of a company are what drives purchasing policies, and it is the reason why the Refectory and Bon Appetit are enjoying success at the university. In the interview with the dining director, he made is clear that the initial impetus for seeking a new operator to run the largest part of the dining operations (The Marketplace, The Great Hall, etc.) was finding an operator whose goals and vision matched up with the goals and vision he had for dining services.

*Risk and Uncertainty*

The University of Wisconsin study found that many universities had a minimum requirement for liability insurance for suppliers of food to dining operations. In conversations with the Dining Director, this requirement was not apparent at Duke, and by the amount of local purchasing that is currently occurring, it would seem that this is not a deterrent. In fact, no operators discussed risk as a significant barrier to sourcing locally. In a general sense, risk is tied into the fact that many operators choose to stick with one large supplier, as there can be greater
uncertainty in developing an unfamiliar system. On the other hand, having a less diverse supplier base can be riskier than having multiple suppliers, especially if one supplier gets into trouble. In the conversation with Chef Marconi of Bon Appétit, he related that in his view, risk was not a barrier because working with farmers provided numerous benefits. Keeping food safety in mind is important, in his view, especially for washing produce and other items, but the benefits of having fresh ingredients outweighed many risks.

Commitments

A vicious cycle was identified by Johnson and Stevenson (1998), wherein farmers want commitments from food operators before planting to ensure they have a market for their product and operators are often unwilling to make such commitments as they are generally worried about production risks. In the event of a natural disaster that wipes out a crop, operators would be in an unfortunate situation. In that system, farmers would be unwilling to plan the harvest around operator’s needs, and products would be unavailable for operators when they need them. Chef Marconi was keenly aware of the commitments needed, both from his experience at Duke and previous work experiences. In the past, he worked with farmers during the production season, as well as purchasing from farmers’ markets, but he suggested that working with farmers before the planting season can be an ideal model for building relationships.

From the experience that farmers have over many growing seasons, they are keenly aware of the amount of harvest their land can produce for each product. In addition, they have built a positive track record by successfully harvesting year after year. By the same token, food service managers are also aware of their seasonal needs through providing service at the university, which is relatively uniform year to year, as the number of students, staff and faculty remains fairly consistent. By utilizing that knowledge, food service managers can plan for their
own demands throughout the year and work with the farmers to develop a mutually beneficial relationship.

**Availability**

The issue of availability is one that came up in a number of conversations with food service managers, and is also a major impetus for this research. In order for food service managers to adopt local buying policies, there needs to be an adequate supply of local food to be purchased. In the Durham area, the local food system is growing, and expanding into new markets, as shown by the farmer survey. Bon Appétit is in the process of establishing new relationships with farmers in order to expand their supply of local food in coming years. Saladelia related that it would be willing to use more suppliers if there was a greater availability of products.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Current System</th>
<th>Costs</th>
<th>Number of Suppliers</th>
<th>Risk</th>
<th>Commitment</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpine</td>
<td></td>
<td></td>
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* Indicates operators with local food purchasing policies established

**Recommendations**

The recommendations can form one large program or campaign revolving around locally produced food in NC, or each can be taken individually as initiatives to support green dining activities at the university. Each recommendation is an idea that is focused on either providing an incentive for operators to purchase locally, or making it easier for farmers and food service
operators to interact. Based on the key requirements identified by Johnson and Stevenson, there are costs to both the university and to the farmer in order to connect the two. The recommendations are provided to help diminish those costs, or offset the costs associated with local purchasing.

1. **Adjust PACE scoring to provide incentives for buying local product** – In Greg Andeck’s inventory of green dining at Duke, adjusting the PACE scoring system was one the main recommendations associated with each category. It is also the “low-hanging fruit” as it costs the university very little to adjust the system and operators have an incentive to follow the system in order to thrive in this environment. Reviews of the scoring and weighting of the categories takes place yearly, and responds in part to student demand, as well as other factors. Student preferences can be passed along through the Student Dining Advisory Committee, a Student Government committee that connects dining administrators (Jim Wulforst) with students. The members of this committee are also part of the process that provides reviews of the operations as part of the PACE program.

The addition of a local food purchasing provision in the scoring would allow operators to decide whether it is in their interest to purchase locally and make purchases that are appropriate to their facility, without providing an unnecessary cost burden to do so. The scoring system allows the operator different options for incorporating sustainability into their operations, sourcing locally would be one of those options. Another provision of the PACE system that could influence the implementation of sustainability measures is the monetary incentives given at the end of each year. This monetary incentive can help operators offset any extra costs associated with implementing sustainability measures, such as sourcing locally.
Local purchasing policies could be added into the PACE program in other ways as well. Currently, each category in the PACE system has a number associated with it, and you score points in that category if you comply. For example, an operator can get seven points for using unbleached napkins, but gets zero points in that category if they use do not use this type of napkin. Another more flexible way to apply the scoring in the PACE system could be to provide dining operators with a list of greening activities, from which they could choose to implement a predetermined number, based on their needs and resources. In this situation, the operator would get a certain number of points depending on how many greening activities they implemented, and they have the flexibility to choose which activities are appropriate to their operation.

(2) Dedicated staff position – Any university involvement in green dining or work facilitating farmers and food service operators is going to require a staff person focused on these issues. Greg Andeck offered up this suggestion in his MP, and subsequent to that, the duties of green dining coordinator were defined by Dining Services and given to one of the current employees. I offer up this recommendation again because the duties were given to the current Quality Assurance Specialist, and the dining director made mention during the interview that the portion of time being allocated to greening activities is trumped by the current duties required of that position. A dedicated staff member is one that can budget the majority or their time to green dining.

(3) Connect food managers with farmer – Developing relationships between dining operators and farmers is essential to breaking down many perceived barriers, such as quality, quantity, and reliability. It has the added benefit of illuminating local production resources that dining operators may be unaware of. In that sense, connecting these two groups does two things: 1) it allows dining operators to become knowledgeable about what farmers in the area can provide
and how they provide it; and 2) it allows farmers to become more knowledgeable about what the dining operators are looking for in terms of quality and selection. Connections can be made in two ways, by organizing a university forum that includes farmers and operators or organizing farm tours for operators to see how the farm systems work. The idea is building relationships, and ideally both methods would be pursued, as they are directly related.

(4) *Duke facilitated farmers’ co-operative* – Duke cannot lower the direct costs associated with purchasing local food, but it can lower the transaction costs for dining operators to purchase from farmers. The idea behind the university supported co-operative is that the university helps a group of farmers form a co-operative, and in return, the co-operative has an established market ready to purchase their products. As an example of the effectiveness of co-operatives, Bon Appetit uses ECO as a source for produce instead of sourcing from multiple produce growers in the area. In many cases, farmers are going to need to collaborate in order to overcome institutional barriers. University involvement or support of this type of collaboration would ensure the co-op has a guaranteed market once formed, and ensure the co-op is focused on the university as a supply partner.

A co-operative that is supported by or facilitated by the university is also a natural step forward after the connections have been developed from recommendation number 3. Once the connections/relationships have been developed wherein both sides have an interest in moving forward, a co-operative is a structure that helps overcome a number of barriers identified by the operators in this study.

**Challenges**

The most important test of whether a program or initiative can be effective is whether or not it is feasible, or in other words, if a program is not feasible to implement, then it is not worth
pursuing. The most important aspects of feasibility for the sake of these recommendations are economic feasibility and organizational feasibility. Economic feasibility is concerned with the return on investment from such a project (do the benefits outweigh the costs) and organizational feasibility is concerned with whether the structure of the system is amenable to such a program.

- **Economic Feasibility** – As alluded to throughout this analysis, the direct economic costs of purchasing local food can be higher than that of traditional procurement. Many food service operators are willing to work with farmers to reach a mutually beneficial agreement on prices. Nevertheless, costs are incurred on both the producer side (farmers) and consumer side (university), which are both addressed through the recommendations. Opportunities exist at the university, through offsetting costs with incentives and lowering transaction costs by building relationships, which can increase the economic feasibility of such a project.

- **Operational Feasibility** – Two aspects of the system structure may affect the organizational feasibility of the recommendations: franchise procurement policies, and the system of contract management. Franchise procurement policies require restaurant chains operating at the university such as McDonalds, Chick-fil-A, and Subway, to use particular food service companies for purchasing. Franchise arrangements leave less room for changing procurement policies than individually owned operations. The system of contract management, as opposed to the pre-1997 system of Dining Service operated facilities, makes it difficult for the university to apply across the board policies related to procurement. Many of the colleges analyzed by Johnson and Stevenson (1998) were relatively small and still operated their own facilities, which made it easier for the university to exert influence. The existence of the PACE Program, in my view, provides the leverage the university needs to make appropriate changes.
The feasibility and practicality of these recommendations hinges lastly on the priorities of Dining Services, which is in turn influenced by student pressure and demand. As mentioned earlier, green dining has remained a high priority item for Dining Services, but the PACE scoring system fails to properly address green dining issues. I have met with Jim Wulforst, the dining director, and he is highly open to student engagement and activity in the realm of dining management. The original resistance I encountered when approaching this issues was a function of how busy Dining Services employees remain during the year, and not a function of lack of interest. In addition to his work at Duke, Jim travels and speaks extensively to other universities and institutional dining operators interested in the PACE Program. It is a novel program and ahead of the curve in many respects compared to other institutional systems. I cannot stress enough the importance of student involvement in any changes. The success of the Refectory, which markets itself as an environmentally-friendly eatery, and sources a greater percentage of its food locally than the other operators, illustrates that there is a demand for locally sourced food on campus. Jim evaluates the system and makes changes on a yearly basis based on student and employee input. Feasibility rests as much on student demand, as on any other factor. If the students demand local, Dining Services will respond to the request.
Appendix A: Farmer’s Market Survey

Farmer Survey of Market Trends

Privacy Statement: Hi, my name is Carl Chamberlin, I am a Master’s student at Duke University, and I am hoping you would consider participating in a survey on markets for farm products. This survey is part of the research for my Master’s Project at Duke University, and is intended to help identify the current markets being served by small farmers. It also will be used to determine if other markets exist that could be utilized in the future. I will not record your name or the name of the farm, so the survey will be confidential. The survey should take no more than 5 minutes. Please feel free to skip questions or stop at any time. Here is my card so you can contact me if you have any future comments of concerns, please contact Carl Chamberlin, cmc59@duke.edu, with any questions about this study. Thank you for your participation.”

1. How many acres comprise your farm? ______

2. How many acres are actively cultivated? ______

3. Is the land owned or leased? Circle one: Owned Leased

4. What year did you start farming? ______

5. What items do you produce? Check all that apply:

   _ Beef    _ Dairy
   _ Pork    _ Vegetables
   _ Poultry _ Fruits
   _ Eggs    _ Other ______

6. What is the annual gross income from farming activities?

   _ less than $5,000    _ $25,000 to 34,999    _ $100,000 to 149,999
   _ $5,000 to 9,999    _ $35,000 to 49,999    _ $150,000 to 199,999
   _ $10,000 to 14,999  _ $50,000 to 74,999    _ $200,000 or more
   _ $15,000 to 24,999  _ $75,000 to 99,999

7. What is the annual gross income for the entire household?

   _ less than $5,000    _ $25,000 to 34,999    _ $100,000 to 149,999
   _ $5,000 to 9,999    _ $35,000 to 49,999    _ $150,000 to 199,999
   _ $10,000 to 14,999  _ $50,000 to 74,999    _ $200,000 or more
   _ $15,000 to 24,999  _ $75,000 to 99,999

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8. Please list other sources of farm income that may apply, i.e. government payments, agritourism, bed and breakfast, etc.

9. What year were you born? __________

10. What is your gender? __________

11. What county do you farm in? __________

12. Please list all production techniques used in regards to sustainability or conservation, i.e. polyculture, crop rotation, low inputs, IPM, etc.

13. What percent (estimation) of income is derived from each product sold?

   - Beef
   - Pork
   - Poultry
   - Eggs
   - Dairy
   - Vegetables
   - Fruits
   - Other __________

14. Where are products marketed or sold?

   Check all that apply:

   - Distributor/wholesaler
   - Retailer
   - Farmers’ market
   - CSA
   - Specialty Store
   - Processor
   - Website
   - Cooperative
   - Farm Stand
   - Other __________

15. What percentage of income (estimate) is derived from each venue?

   - Distributor/wholesaler
   - Retailer
   - Farmers’ market
   - CSA
   - Specialty Store
   - Processor
   - Website
   - Cooperative
   - Farm Stand
   - Other __________

16. What other option may exist for marketing that aren’t being utilized?
17. List phrases used to market different products, i.e. organic, natural, free-range, local, sustainable, etc.

18. Do you perform value added processing? If so, please list types.

Appendix B: Dining Operator Question

1. Does your establishment purchase any ingredients from local sources?

2. Does your establishment have a local food policy?

3. If so, can you provide any figures on the number of supplier?

4. If so, can you provide any figures on the percentage of total purchases?

5. What do you perceive as barriers to purchasing directly from farmers?
Works Cited


