LAFARM-TO-DINING PROCUREMENT SYSTEM

TO: BENJAMIN COHEN
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CC: SARAH EDMONDS
DATE: MAY 9, 2013
SUBJECT: FINAL MEMORANDUM FOR EGRS CAPSTONE PROJECT

RESEARCH QUESTION

The goal of this project is to explore the relationship between dining services and the Lafayette Farm, barriers to using local produce at the institutional setting, and management techniques to overcome those barriers. More directly, we ask what information needs to be communicated between the garden manager and dining services, and how can we develop a robust system to promote that communication?

BACKGROUND CONTENT

Sustainable food initiatives on college campuses have been expanding rapidly across the United States over the past few years; many of these initiatives are in their incipient stages and their resilience is not yet assured. These projects have taken shape in a variety of ways and with unique goals. However, common amongst all is the desire to have transformative potential in the larger alternative food movement. Lafayette is one of these campuses with a growing coalition to support local sustainable food production In 2010 Lafayette College was awarded a $10,000 grant to support the development of a sustainable "food loop" through phase one of the EPA P3 "People, Prosperity, Planet" sustainable design contest (LaFarm website, 2012). The Lafayette "food loop" conceptually diagrams the relationship between dining services, food waste and the Lafayette Garden, in a sustainable closed loop system. The garden later re-named LaFarm has since been a prime topic for student research and volunteer opportunities. With the addition of a new garden manager, Sarah Edmonds, and a new dining services provider Bon Appetite, we see the current potential for transformative change within Lafayette's food system. With that in mind we have identified several issues with the current structure of the sustainable food loop on campus that need to be addressed in order to increase the role of campus food production into the dining facilities.

Beginning this project, we first developed a refined visual map of the Lafayette food loop system, which takes a closer look at the socio-technical relationship between the garden and dining services. Steps that were previously overlooked include the planning, planting, harvesting, cleaning, transportation, preparation, and cooking of the food taken from the garden, all of which must be addressed in transforming the farm-dining relationship. As a team we met to define this issue at Lafayette, looking towards

scholarly research done at similar institutions and the solutions which they have developed to overcome this. We also met with Sarah Edmonds to discuss her thoughts on the product, through which she has provided us with useful information moving into developing our final product.

Our first observation about the Lafayette garden and dining services dynamics is that there is a mismatch of scale which created some issues around the procurement of garden produce. The mismatched scale of local food producers and large food service institutions presents significant challenges in incorporating local food in institutional meal planning (Friedmann, H., 2006). This type of food production system requires a structural change in meal planning and preparation, meaning local food is not easily substituted into the food services menu. While many large institutions recognize the growing demand for local and sustainable food, these challenges often create a substantial barrier in providing locally sourced meals. Lafayette finds itself in a similar dilemma. Despite student demand for locally sourced foods, and the development of the Lafayette organic farm (LaFarm), there are still barriers to utilizing college grown produce. We therefore aim to address these challenges to improve the sustainability of Lafayette Dining Services.

Through our scholarly research we have identified the reasons scale matters in food services, including legal, economic, and managerial. Our project looks into the economic and managerial aspects of using local food in the institutional setting. One of the first issues is that with local food production, large institutions must internalize the process of food preparation, such as cleaning and cutting, which would normally happen at a food processing facility. This significantly adds to the "cost" of using locally grown food especially at the scale of a large institution, and often these institutions lack the capacity or knowledge to do so (Barlett, P.F., 2011). The second issue has to do with meal planning. Increasing the amount of local food into the meal plan, may limit or alter menu choices throughout the year due to the seasonality of food production. Over the past 20+ years large institutions have gotten accustomed to the ease of using global food suppliers, which can fill orders easily due to their extended networks of farmers and because they are not limited by seasonal choices (Barlett, P.F., 2011). This ordering process makes it sufficiently harder for local farmers to meet the demand at the institutional setting not just in quantity but also in variety.

Finally through our research we were able to identify some good working relationships between dining service providers and student run farms. These programs relayed heavily on good communication and coordination, and were dependent on strong social networks (Wharton, C. Harmon, A., 2009). Therefore, incorporating local food into the institutional setting requires a significantly closer relationship between farm management and dining services and advanced planning to reduce waste of garden produce.

PRODUCT OVERVIEW:

We developed a product to both manage and facilitate the relationship between the garden manager and dining services, and to help build a robust plan for garden and dining services timelines. The final product is an excel database accessible to the Lafayette community that will allow better information communication between dining services and the farm. This database addresses some of the issues of planning and preparing for the use of LaFarm produce in the dining halls, specifically by integrating harvest timelines and meal planning schedules. The use of this system will help users to better facilitate and understand the dynamics of supply and demand in the Lafayette food system.

The excel document is a data management tool that uses planting dates and quantity planted, to produce an estimated harvest timeline. This is then converted into a weekly produce availability chart for dining services from which they plan meals. We recognized the need for flexibility in the planting and harvesting schedules which can be affected by various factors such as weather and available garden helpers. This system is intended to help inform dining services about changes in the harvest timeline and weekly availability of produce. The excel document is formatted to accommodate multiple plantings of the same crop and variable harvest schedules. It functions so that the user can differentiate between crops that are available in bulk harvests or continuous harvests. Bulk harvest crops are types of produce that correspond directly to planting date, while continuous harvest crops may be planted once and harvested on a regular basis (i.e. basil). Additionally it provides dining services with a weekly breakdown of available harvest, and space to record the difference in quantity available and demand, thus providing information to improve next year's planting schedule.

The database is formatted to with the produce types which Sarah provided. At this time we have formatted the database and provided estimated information for variables such as quantity produced per foot planted, seed start dates and day to harvest, though real-time data should be taken throughout the summer to build a robust system. Consistent communication with Sarah will be useful in implementing this data into the database. Moving forward with a new dining services provider this system should be refined with their consultation.

FUTURE RECOMMENDATIONS:

The next step in developing this system should be the collection of real time farm data, on planting dates, days till harvest, harvest quantity, and plot area. We see this being a useful job for a student gardener or EXCEL research student. Currently the new dining contract provides for a part time student employment opportunity to work on the garden, which we think would be an ideal candidate to initially manage this system. Collection of real time data will allow the user to make a more robust system, specific to the Lafayette Garden. Additionally we feel this should be done on a yearly basis, to measure improvements in efficiency and reliability.

The database is intended to have administrator user accounts that have the privilege to post and edit data, as well as public logins that would be accessible to the general population. Because the first iteration of this database requires input of planting data, we recommend that this be followed through after this planting season. Additionally, as per request of Sarah, access should be set up the system so that only she could edit the garden information. Finally it should then be posted over the Lafayette Network, where all users could access this information through their Lafayette Log-in. Further we envision this product to be publically accessible and displayed in dining facilities better inform students about the produce that is being sourced from the garden, to encourage more sustainable food choices.

While a good portion of this project will be led by the garden team, we feel that it is important that moving into the future Lafayette should designate a full time dining services employee to work with Sarah on this project. This person should be responsible for communicating to Sarah the types and quantities of produce desired by dining services as well as coordinate produce pickup dates around the garden timeline. This person should also coordinate with those in charge of coordinating dining meal schedules so as to ensure that garden produce is planned into the dining plan.

APPENDICES

APPENDIX A: Annotated Bibliography

Barlett, P.F. (2011). Campus sustainable food projects: Critique and engagement. *American Anthropologist*, *113*(1), 101-115. doi: 10.1111/j.1548-1433.2010.01309.x

This article discusses the resilience of alternative food initiatives on college campuses and their potential to be a transformative power. It states that to be transformative these institutions must have the intent and capacity to make a broad impact. The article addresses four main components of campus sustainable food project, including: dining services innovations, academic programs, direct marketing opportunities, and hands on experiences in community gardens and campus farms. Specifically applicable to our project is the discussion of Dining Services innovations. The article states that creating new supply chains for dining services can present some of the most complex challenges for campus food efforts. It then goes on to describe sustainable food purchasing guidelines first adopted by Yale University. The article also discusses the increased competition to meet sustainability goals amongst the big three food service corporations which includes Sodexo, however notes the challenge of incorporating a local supply where menus are set a year in advanced. This article in particular is very relevant to our topic, by addressing the particular challenges that we see between Lafayette farm, and our dining services, and provides a bit of insight as to why we so much waste of food produced on campus.

Bon Appétit. (2009). *Student garden and food service. R*etrieved from http://bamco.com/uploads/documents/student_garden_guide_final_-_food_service.pdf

Brown, C. & Miller, S. (2008). The impacts of local markets: A review of research on farmers markets and community supported agriculture (CSA). *American Journal of Agricultural Economics*, *90*(5), 1296-1302. doi: 10.1111/j.1467-8276.2008.01220.x

This article discusses the economic and social cost and benefits of alternative food production methods including farmers markets and CSAs (consumer supported agriculture) to both the farmer and the community. The authors base their findings on multiple case studies from several states and nationwide surveys. They discussed economic and community surveys conducted beginning in the later 1990s through 2005. The author finds that both farmers markets and CSAs were primarily used to supplement their business, but felt that they helped to improve their profit. They found that the average share price for CSAs in 1999 was around $180 but only covered basic operating costs and resulted in zero return on farm family labor. They estimated that a breakeven share price would need to be around $415 to cover operating cost and yield a fair return on the farmer's labor. They also found that while only a small portion of farmers (30%) who participated in farmers markets considered the farmers market the most important source of their income, the authors identified these venues as "keystones for rebuilding local food systems." Overall this article will be useful in identifying the ways that we can develop long term economic sustainability on the Lafayette farm, and the importance of these social networks for the success of the farm.

Carlson, S. (2008, September 26). Colleges chew on local-food phenomenon. *Chronicle of Higher Education*, *55*(5), A14. Retrieved from ERIC, EBSCO. Retrieved from http://0-chronicle.com.libcat.lafayette.edu/article/Colleges-Chew-on-Local-Food/35373/

This article explores the use of local food by college dining programs. The author, Carlson Scott is a senior editor at the Chronicle of Higher Education. The editorial article explores generally the benefits of using locally grown food in college dining. Benefits include: flexibility of college dining services, a portrayal of college commitment to sustainability. The article however is not peer-reviewed. This limits its credibility. It relates to our project as it highlights some benefits of local food programs in colleges.

Chan, K. Y., Orr, L. L., Fahey, D. D., & Dorahy, C. G. (2011). Agronomic and economic benefits of garden organics compost in vegetable production. *Compost Science & Utilization*, *19*(2), 97-104.

This paper analyzes the agronomic and economic benefits associated with the use of compost, further supplementing the previous resource. The authors are Australian researchers who, through a field experiment in Sydney, showed that compost use results in a higher benefit to cost ratio than its alternatives. Besides its health benefits on crops, compost provided higher yield than alternative practices. The research results are very credible. Not only is the paper peer-reviewed, but it also based on a very scientific methodology. Thus, we believe we should increase the amount of compost available on the farm by using waste from dining halls.

Coit, M. (2008). Jumping on the bandwagon: An overview of the policy and legal aspects of the local food movement. *Journal of Food Policy and Law*, *45* (4) 1-20.

This article addresses some of the legal issues that have arisen with the local food movement, including issues of labeling and defining local. The author begins by addressing the question of what is "local" and how to address issues of food safety. The author covers a variety of different types of consumers and their relationship with the local food market. In particular the author describes the role of institutions such as universities, hospitals schools and government entities in the local food market. The author notes that this is a mutually beneficial relationship between the institution and the farmer. They state that the institutional purchasing power provides farmers with an assured market for their produce, and provides the institutions fresh and high quality ingredients. Unlike organic food labeling there is minimal regulation that applies specifically to local food, however there are some federal laws and policies that have the potential to affect the local food market. The author then reviews five federal policies that might affect the sale of local food. These policies typically written to promote the sale of local food direct to consumers, but are much less descriptive of quality of the food or production methods. Overall this article is useful in understanding how the local food movement can be supported or hindered by specific food policies.

Community Supported Agriculture. (2009). *National Agricultural Library*. Retrieved from http://www.nal.usda.gov/afsic/pubs/csa/csa.shtml

This library consists of community participation of local farms. Different communities have operated farming programs to support community development. There are current CSA Farms in Easton, PA. Such programs can be further implemented on Lafayette's community. Options can include Lafayette's organic

farm arranging CSA's, or dining services use of CSA's. The project enacts the participation of the local community on the garden and this system can approach community sustainability.

Cranfield, J., Henson, S., & Blandon, J. (2012). The effect of attitudinal and sociodemographic factors on the likelihood of buying locally produced food. *Agribusiness*, *28*(2), 205-221.

This paper, written by Cranfield, J., Henson, S., & Blandon, J. who are researchers from the Institute of Development Studies, explores the longitudinal and sociodermographic factors that determine the intention to buy and consume local food. The researchers used the bavariate probit model to analyze data from an internet survey of Canadian consumers. The study found that attitudinal factors have a greater influence on the desire to consume locally. Indeed, positive views of local farmers and food quality positively affect the intention to purchase. However, the results of this study show some limitation as the sample size was only 1,139. A greater sample size would have resulted in more reliable results. This study implies that the intention to consume food grown in Laf farm shall be positive, as the Lafayette community must view its farm in a ameliorative way.

Dahm, M. J., Samonte, A. V., & Shows, A. R. (2009). Organic foods: Do eco-friendly attitudes predict eco-friendly behaviors? *Journal of American College Health, 58*(3), 195-202.

The purpose of the study is to measure student's awareness and behaviors toward sustainable actions. The authors The study measured the student's eco-friendly behaviors by enrolling them in a course study and surveying such attitudes. Based on availability and awareness, students are more conscious about organic food options. Similar surveys can be given to Lafayette to diagnose what students are looking for at Lafayette dining services. Also these eco-friendly behaviors can be further adapted to campus.

DeBlieck, S., Strohbehn, C., Clapp T., & Levandowski, N. (2010). Building food service staff familiarity with local food. *Journal of Hunger & Environmental Nutrition*, *5*(2), 191-201. doi: 10.1080/19320241003800318

This article focuses on local agriculture at Iowa State University. Geographically, the article portrays the conflicts in temperate regions. Authors have a background in health and local agriculture. Farmers in temperate regions are limited by seasonality of fruits and vegetables. The author also reflects these regions consist of low infrastructure and distribution of local production. Dining services have difficulties with time adapting local produce in menus, time to prepare meals and

the skills to utilize local agriculture. We must induce these risks when complying local food irregularities.

Deo, N. (2011, December 1). Dining halls should be more sustainable. Message posted to http://www.collegiatetimes.com/stories/18920/dining-halls-should-be-more-sustainable

This article is about the efforts made in some US college for sustainable dining halls. The author, Virginia Tech student Neetu Deo, a columnist in COLLEGIATETIMES, explores ways his university improved sustainability in its dining halls by supplying them with organic, locally grown food and by efficiently using their food waste and leftovers as compost. He writes that compost is both a nutrient rich fertilizer that decreases the amount of waste that goes in landfill, among many other of its economic and environmental benefits. Deo suggests that dining halls should be more sustainable. This article however is not peer-reviewed and the author's claims are not fully justified by some specific bibliography. This limits its credibility.

Dickinson College. (2013). *College farm*. Retrieved from http://www.dickinson.edu/about/sustainability/college-farm

This is the website for the Dickinson College Farm which will be useful in providing information about a successful model of student farm within the liberal arts college setting. This college farm provides both food to their dining services, and uses the CSA model to support faculty and student alike. This farm was first started in 1999 and since has grown from a small student garden to a 50 acre fully functioning farm with both produce and livestock. In addition to a background of this farm, the website provides information about Dickinson's dining services and how they plan a growing season around dining services needs. While this source will be useful, it doesn't provide information regarding specific logistics of the farm function, and doesn't provide information on what challenges there were and how they were overcome. Overall, the website provides information on how the farm functions which will be a useful tool in shaping the direction of our capstone project.

Erickson, C. (2012). *Student sustainability educators*. Association for the Advancement of Sustainability in Higher Education. Retrieved March 3, 2013, from http://www.aashe.org/files/documents/resources/eco-reps_guide.pdf

Student sustainability education and outreach programs have created a national, student led programs to address sustainability and promote sustainable habits. Educational institutions have engaged in these programs to structure the student's

participation on pro-sustainability. Lafayette students have submitted Eco-Rep program on campus to gain direct environmental stewardship within the student body. These types of programs will entice the community to initiate sustainable practices. It will also develop our project goals of community awareness. These initiatives will promote student responsibility as an actor of sustainable progress, such as the dining service contract.

Friedmann, H. (2006). Scaling up: Bringing public institutions and food service corporations into the project for a local, sustainable food system in Ontario. ***Agriculture and Human Values, 24*****(3), 389-398. doi:10.1007/s10460-006-9040-2**

This article serves to address the increasing demand for a local, sustainable supply of produce within large institutions such as universities. This article describes what it calls a "breakthrough" in the long standing attempts to scale up local food supply chains in Toronto, Canada. It describes the relationship between a non-governmental certifying organization called Local Flavour Plus and the University of Toronto, which has recently began to require (2006) that corporate caterers use local and sustainable food supplies for a small but increasing portion of its meals. The article describes LFPs purpose and methods, which can be summarized as an organization that facilitates the sustainability certification of local farmers and facilitates relationships between local food suppliers and larger institutions. Its method includes a ladder system for caterers to increase their use of local certified foods in their meal plan, and offers incentives to exceed their benchmarks. This would be a useful example of how corporate caterers can build better relationships and dependence on local growers. While this article itself does not provide a detailed description, it would be worthwhile to look into the details of LFPs model for facilitating the growth of the sustainable agriculture through large institutions. Overall this is another example of how one might build relationships between local growers and a college institution.

Hardesty, S., Allen, P., Feenstra G., Ohmart, J., Perkins, P., & Perez, J. (2008). The growing role of local food markets. ***Growing the Local Market, 90*****(5), 1289-1295.**

There has become growing demand of locally grown sustainable produces at colleges. Economically there is a market available according to research data on operating farm-to-college programs. The author, Shermain Hardesty has a well-developed background in Economics and Agriculture at the University of California. Although in different geographical areas of the U.S, Lafayette College has become one of these colleges with an increased demand in local vegetation. But unlike institutions in Iowa, Lafayette will still salvage seasonal variability. Nationwide surveys have reported 41% of college students felt the importance of sustainable food, 30% of national student see locally grown food highly important

and more. The article also discusses issues to foresee with locally grown products such as pricing. To dining service managers' issues in pricing, year-round supply and availability were all ranked high. This article also discusses the farm-to-college model in which reliability, consistency and delivery all showed a challenge to institutions. The author provides feasible options to mitigate the relationship among locally grown and institutionally provided for; such as more sustainable food service providers (to increase partnerships) and increase education to the community.

Henseleit, V., Kubitzki, S., Schotz, D., & Teuber, R. (2007). Consumer preferences for locally produced foods - A representative analysis of the influencing factors. ***Berichte Uber Landwirtschaft*****,** ***85*****(2), 214-237.**

This study by German university researchers analyzes the factors influencing consumer preference toward locally grown food. Binary logic model was used to determine the factors that influence consumer preference towards local food. The study found that cognitive and normative factors affect consumer preference more than do affective and socio-demographic ones. Also, the idea that consumers are supporting is significantly and positively related to consumer preference for locally grown food. Thus, a strategy to increase support for our project in the Lafayette community would stress food quality and support to the college farm.

Lafayette College. (2012). LaFarm, the lafayette college community garden and working farm. Retrieved from http://sites.lafayette.edu/organicgardening/

This is the Lafayette College website for the organic farm. It provides relevant contact information as well as a timeline of the progress of the garden since its implementation. It also provides a valuable place for communication amongst members, and information about gardening at Lafayette and how to get involved. Overall this site will be most useful for understanding what projects have been going on at the farm, and the progression of of the farm over the past four years. While this source is not as rich as some of the others it is a good starting place for understanding the history of the Lafayette Farm and its connection to the broader campus community.

Parr, D. M., & Trexler, C. J. (2011). Students' experiential learning and use of student farms in sustainable agriculture education. ***Journal of Natural Resources and Life Sciences Education*****,** ***40,*** **172-180.**

This article explores student opinions on how their involvement in college farms enhanced learning experiences in their formal educational program. The article is about research conducted by Cary J. Trexler, assistant professor of Agricultural and Environmental education at University of California at Davis, along with his graduate student Damian M. Parr. The researchers focused on students who worked and studied at student farms (SFs) to find that the latter were effective for experiential learning. The findings are strong in that they confirm existential learning theory: that knowledge is constructed when theory and practice are combined. However, a possible weak point for this study is that it focuses on a specific select of students, probably the most studious learners who might have already shown interest in practical learning through the farm. The article bolsters our idea that there is need for more student and faculty involvement in the farm. This can be achieved by integrating more of the farm product into our dining hall food supply as this can potentially raise awareness and involvement of the Lafayette community about the farm.

Parez, J. & Allen, P. (2007) Farming the college market: results of a consumer study at UC Santa Cruz. The Center for Agroecological & Sustainable Food Systems, University of California, Santa Cruz. Research Brief 11. Retrieved from: http://escolarship.org/uc/item/1fc6r188.

This is a research brief of a study conducted in collaboration with groups at UC Santa Cruz in 2005. They conducted a survey open to faculty and students within the UCSC community that addressed participant interest in food system issues, labeled food purchasing patterns, and willingness to pay for social justice. The authors addressed issues they saw in their study that might have altered results, including the way certain questions were asked and the potential discrepancies between action and survey results. Their findings included that a significant proportion of the surveyed population was interested in food related issues including sustainability, many people were willing to pay more for food that had been ethically produced, and people regularly bought food labeled as organic or fair trade. However they did find that few respondents would be willing to pay more for a meal plan that included sustainable food. Overall this study will be useful in identifying how our college campus might respond to implementing a sustainable food system into our meal plan.

Pursehouse, C. (2012). Sustainability in housing and dining operations. *New Directions For Student Services*, (137), 41-52.

This chapter from the book examines the sustainable efforts of colleges and universities, such as College Sustainability Report Card. One objective is the student's learning and sustainability potentially impacts housing and dining operations at school. Clive Pursehouse has been on-campus student affairs director and actively serving sustainable efforts. Actively allowing students to

monitor interactive database of resources, such as local produce, will provide proactive decisions. Lack of communication among the dining services, the garden and Lafayette's faculty and students reflects less motivation for quality than price. Strategies such as working with vendors, such as Lafayette's vendor Sodexo, will promote such sustainable efforts. But further, integration of community development will flourish sustainable efforts.

Rigby, D. & Caceres, D. (2001). Organic farming and the sustainability of agricultural systems. *Journal of Agricultural Systems, 68*(2001), 21-40.

This article offers a general overview of the challenges of sustainable agriculture in modern society. It considers the relationship between sustainable farming and organic farming and the various policies that must be established to protect the consumer. It identifies the importance of the organic certification scheme as an important driver in the organic food market over the 1990s (study conducted in early 2000). The article then goes on to discuss some of the issues regarding the organic standards and regulations that have resulted in organic farms being less sustainable than their non certified counterparts. The authors conclude stating "the attempt to produce overly prescriptive descriptions of sustainable agriculture may be of little use," and fear these policies could inadvertently recreate the same issues of scale, distance and control that governs the conventional food system. Overall this article addresses several of the issues we have observed on the Lafayette farm with the pursuit to become organic certified, such as the issue with using compost on the farm. The article addresses the fact that many of these small scale farms that might otherwise be following organic methods have been negatively impacted by the certification scheme which benefits only large scale producers.

Stan, V., Virsta, A., Dusa, E., & Glavan, A. (2009). Waste recycling and compost benefits. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, *37*(2), 9-13.

Stan, Virista, Dusa and Glavan are researchers from the University of Agronomic Sciences and Veterinary Medicine in Bucharest Romania. In this paper, they research some of the benefits of using compost in agriculture. Not only does compost have the potential to inactivate pathogens thermally, but also decreases the amount of organic waste, but also prevents the use of pesticides in a very effective way, according to the researchers. Additionally, they highlight the proportionality between improvement in bulk density, porosity, hydraulic conductivity and water retention capacity to compost race. This document, peer-reviewed and written by highly trained professionals in their field, is of utmost credibility.

Sustainable Energy Fund. (2009, October 18). ***Annual Report to the Pennsylvania Public Utility Commission and to the Joint Petitioners*****. Sustainable Energy Fund. Retrieved from**

The organization funds various programs on renewable energy and energy efficiency. Lafayette College has participated with the organization in funding $15,000 grant for a solar panel installed at Metzger Fields Athletic Complex. The report includes the community's contribution to renewable energy and energy efficiency. The SEF implements their mission through education, finance and program administration. These like-programs will promote the community responsibility in energy conservation.

U.S. Environmental Protection Agency, Campus Consortium for Environmental Excellence. (2007, January). ***Best management practices for colleges and universities*****. Retrieved from http://www.epa.gov/region1/assistance/univ/pdfs/bmps/BatesReformat1-8-07.pdf**

This booklet of best management practices by the EPA targets colleges and universities. It is about college dining services composting program. The EPA aims to reduce waste sent to landfill, decrease the costs of processing food waste through composting and increase recycling by using unbleached recycled paper napkins in local farms for compost. This project is geared towards Bates College. Interestingly, Neetu Deo, in the previous article mentioned that Bates College is a reference in sustainability for schools. The booklet remains credible as it has been developed by the EPA. It supports our approach of both increasing local farm food consumption in dining services and reducing waste from dining halls through composting.

Wilkins, J., Bowdish, E., & Sobal, J. (2000). University student perceptions of seasonal and local foods. ***Journal of Nutrition Education, 32*****(50), 261-278.**

There is a societal context of how people perceive local gardens and markets. Researchers have analyzed the terms such as seasonality and locality to understand how well educated people are about these sustainable initiatives. As shown on the surveys, terms are used interchangeably to describe an array of objects. As shown in the article, people understood terms such seasonal and local to refer to other subjects such as political and economic structures, but also in relation to food. In order for communities, such as Lafayette, to integrate an effective food system, the public interests in dining seasonally and locally must correlate with their dieting habits. The study surveyed the uses and understanding of the terms and students were grouped based on their studies, such as economics and nutritional subjects. The results analyzed the understanding of the terms and reported that the most important factors were the value and quality, and showed

little reflection of consumers just to support local farmers. The article furthers assists the rationales behind such terms in political context to make the public better understand such phrases.

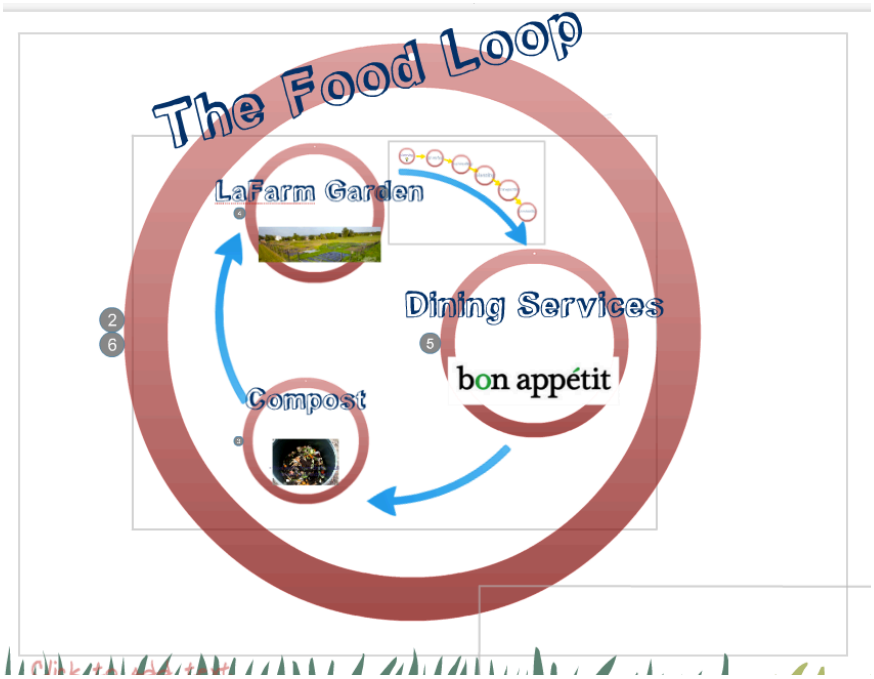
Wharton, C. Harmon, A. (2009). University engagement through local food enterprise: Community -supported agriculture on campus. ***Journal of Hunger and Environmental Nutrition, 4*****(2), 112-128. doi: 10.1080/19320240902915235**

This article identified CSAs as a useful alternative source of produce within communities including the college setting. It identifies several pre-existing networks in the college community that make CSAs a potentially successful alternative, including established college transportation systems, and email networks. It also identifies some barriers to overcome unique to the college setting. This includes issues of liability and food service contractual obligations. The authors then discuss a case study of Montana State University's agricultural research and teaching farm. This farm is a two acre vegetable farm which had been launched in 2006 with a $10,000 grant. The authors then discuss the operations on the farm and the way in which these issues were handled (or not in some instances). The authors provide a critique of these operations, however they do not address solutions to these issues. Instead they conclude with a summary of benefits of CSA systems, and identify areas of future research. This example is relevant in our case in that it addresses many similar issues that we face at the Lafayette farm, and presents a case study of a similar campus supported farm.

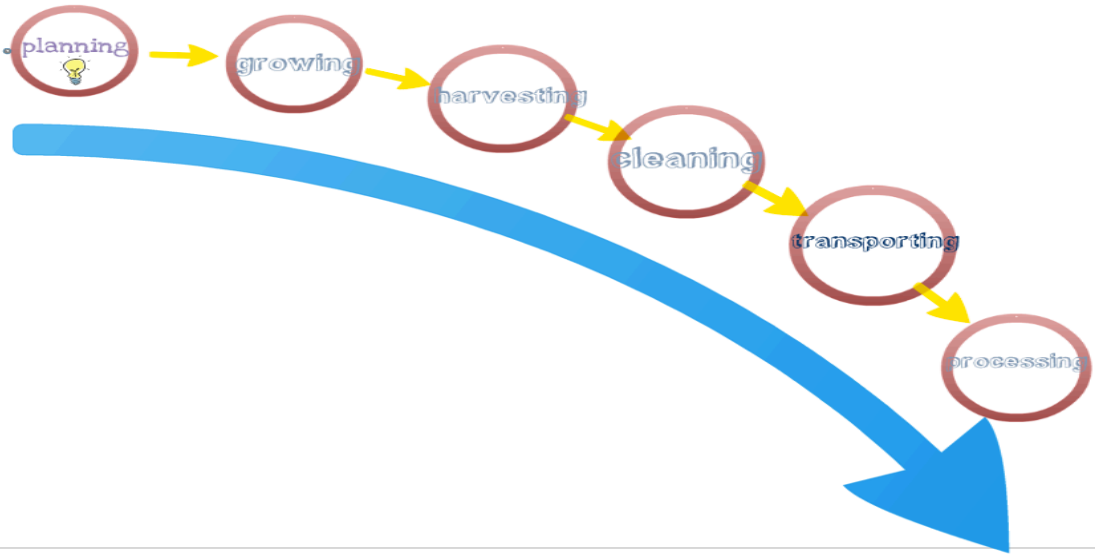
Williams, E., & Lane, D. (2004). ***Web database applications with PHP and MySQL*** **(2nd ed.). Sebastopol, CA: O'Reilly Media.**

This book by software design engineers Hugh E. Williams, David Lane provides a thorough guide to designing and implementing a database system. It explores ways to use and write codes in PHP and MySQL, the two programming languages we are planning on using to design a database system that will be used to coordinate collaboration between the college farm and dining services. The book is a powerful resource, though published in 2004. Additional new techniques of database design will be researched and incorporated in our design.

APPENDIX B: Lafayette's Food Loop System Diagram



APPENDIX C: Bon Appétit flow chart of Farm-to-Dining Managerial Practices



For more information, please view Bon Appétit complete PDF in Appendix A