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NC GROWING TOGETHER

Connecting Local Foods to Mainstream Markets

NC STATE Poole College of Management

Supply Chain Resource Cooperative

Project Meatball

MBA 549: Supply Chain Practicum - Fall 2016

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USDA United States Department of Agriculture National Institute of Food and Agriculture

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Project Meatball was conducted for NC Growing Together project partner Working Landscapes, a non-profit based in rural Warren County, NC. Its mission is to create more sustainable livelihoods for people in the Warren County region through the stewardship of natural and cultural assets.
Workinglandscapes.org

MBA student teams from the Supply Chain Resource Cooperative at North Carolina State University's Poole College of Management have worked with North Carolina Growing Together staff and partner organizations since the summer of 2013 to investigate and address food businesses processes and supply chain needs across the local-to-mainstream food supply chain.

See the accompanying Spreadsheet Tools for Project Meatball, and other MBA-student team projects completed for the Center for Environmental Farming System's partners, here: https://www.ncgrowingtogether.org/research/mba-supply-chain-and-marketing-research-teams/

Note: Some information has been redacted for confidentiality.

Executive Summary

OVERVIEW

Our project focused on a financial, market, and supply chain analysis to estimate the viability and profitability of a new Working Landscapes venture to produce and sell locally-sourced meatballs. The project scope was narrowed to focus only on the ingredients used in the meatballs, and not other meat cuts or products that could be sold from processing an entire animal. We analyzed three primary supply chain scenarios (discussed below). Ultimately, our recommendation is to pursue this venture using the process and supply chain described below. In determining our recommendation, we also prioritized Working Landscapes' organizational goals of enhancing the local community and providing local meat farmers with an additional market.

APPROACH

- We conducted a market analysis to identify potential channels including local distributors, convenience stores, and grocery stores. We obtained price and volume requirements for each. Additionally, we compiled a list of nearby potential buyers using NAICS codes and filtering criteria based on the client limitations and preferences.
- We built a financial tool that allows Working Landscapes to input a variety of factors including cost of livestock, all the way down to the estimated cost of packaging and wages. This tool then creates a *pro forma* income statement, sensitivity analysis, breakeven in terms of meatballs, packages, cows, and dollar amounts, plus a breakdown of cost of goods sold inputs. The tool helps estimate the profitability of the venture as well as what areas require improvement to increase revenue retention.
- With the market analysis and financial analysis, we created a supply chain framework for use in the Working Landscapes business venture. There were a number of factors to consider including where to purchase animals, where to distribute the meatballs, whether to partner with the processor or other buyers to match meat processing demands, whether to process the meatball mix in-house or outsource all or part of the processing, etc.

OUTCOMES

Our research revealed that, with a price point of $5.50 for a ten-ounce package of meatballs, Working Landscapes can expect this to be a profitable venture. The breakeven point is 2.51 cows annually, which is less than the client's current annual purchase rate. We determined that the most cost and logistically efficient process for producing meatballs is to:

- Purchase cows from local farmers and coordinate delivery to processor
- Partner with processor to supply pork for meatballs
- Have a certified spice distributor deliver the spice mixture to processor
- Have processor create a partial meatball mix (beef, pork, and spices)
- Pick up meatball mix from processor

- Add remaining ingredients and cook meatballs at the Working Landscapes kitchen
- Package, freeze, and arrange for distribution by a distributor and directly to Buchanan's (a local retailer)

This supply chain framework, coupled with strategic pricing and distribution, should provide the non-profit with a self-sustaining business venture.

Market Analysis

Market Channels

Our market analysis focused on three market channels: small-scale distributors, small (non-franchise) convenience stores, and small (non-franchise) grocery stores. Each channel included unique pros and cons.

Small-scale distributors were operationally appealing in their ability to manage transportation to the end customer, their pre-established customer base, and their additional offerings such as product marketing assistance. However, minimum production volumes limited Working Landscapes to a small number of willing distributors with flexible volume requirements. We identified and then met with an interested distributor based on contacts provided by the Center for Environmental Farming System's (CEFS) NC Growing Together project. We will refer to this entity as the Distributor, below.

Small (non-franchise) convenience stores best aligned with the mission and vision of Working Landscapes because this market channel often served populations with less disposable income. In addition, this market channel had extremely flexible rules in volume requirements. However, we discovered very few convenience stores that sell (or had interest in selling) frozen meat products within the 40-mile radius dictated by Working Landscapes. In reality, a small-scale convenience store that sells fresh and frozen meat products is a unique and uncommon business model. As a result, Working Landscapes would be extremely limited in their buyer options through this market channel. Also, because these stores have extremely slim margins, they require low price points from their suppliers.

Small (non-franchise) grocery stores showed potential, particularly with locally sourced products. We discovered a few options in the Raleigh-Durham area that currently sold a frozen meatball product and were flexible in volume requirements. However, this market channel required Working Landscapes to coordinate transportation, which could pose logistical challenges. In addition, many of these niche grocery stores served more affluent communities, which is not ideal for Working Landscapes' mission.

Approach

Initially, we collected potential buyers from Working Landscapes and our contacts through the SCRC and CEFS. After conducting phone interviews with most of these contacts and collecting initial data such as price points and volume requirements, we decided to branch out using a more methodical approach in hopes of collecting more data points.

Using North Carolina State University's ReferenceUSA database, NAICS codes 445110 and 445120 for grocery and convenience stores, and Working Landscapes' dictated 40-mile radius; we consolidated a list of over 500 potential buyers. Next, we filtered out buyers that had obvious misalignments with our

targeted market channels such as large chain grocery stores (Harris Teeter, Food Lion, etc.) or large chain convenience stores (Sheetz, Speedway, etc.). This reduced the total list to approximately 300 buyers. At this point, we conducted internet searches for a randomly selected sample of the convenience and grocery stores (approximately 75 in total) and called over three dozen establishments who appeared to have potential based on their internet presence, internet ratings, and online pictures. Only a small number of this establishments we called carried frozen meat products (approximately half a dozen), and none of them expressed interest in carrying Working Landscapes' meatball product. In addition, we were unable to collect price points or volume minimum requirements from these potential buyers. It became apparent that small-scale grocery and convenience stores rely heavily on supplier relationships and were unwilling to give their time to cold-calls from unfamiliar people or organizations.

Our consolidated list has been compiled and organized in the Excel spreadsheet titled "Combined_Filtered". The first column in the spreadsheet dictates whether the establishment was called or not. Highlighted rows indicate a potential for a future supplier-buyer relationship with Working Landscapes, regardless of the likelihood of a future relationship. For example, a convenience store that only carries deli meat is highlighted the same as a grocery store that currently carries a frozen meatball product, even though the grocery store is much more likely to consider Working Landscapes as a future meatball supplier because that product fits into their current product offering. A map of the stores within a forty mile radius of Working Landscapes can be found in **Appendix II**.

Major findings from the market analysis are summarized in the table below.

	Minimum Volume	Meatball Price Point	Distribution Options	What else?
Local Distributor	NA	$5.00 - 5.50	Distributor responsible	
Local Grocery	NA	$5.50 - 7.50	Seller responsible	Everything is legal (certified kitchen) - requires a HASCP (hazard analysis and critical control point) plan. FDA has to inspect it.
Local Convenience Store	NA	Unknown	Seller responsible	Buchanan's – Price point will likely be lower than other options due to low-income customer base.

Financial Tool

Overview

Utilizing the price points and costs determined in the market analysis, we were able to develop a tool that analyzes three different supply chain framework scenarios:

1. Purchasing our own hog and cow livestock; delivered separately to the processor, which prohibits pre-freezing the meat mixture
2. Purchasing our own hog and cow livestock; delivered via a consolidated truckload to the processor, which allows pre-frozen or fresh pick-up of the meat mixture from the processor
3. Purchasing and delivering our own cow, but purchasing ground pork from The processor

After providing inputs for each of the three scenarios, the tool generates for each scenario:

1. *Pro forma* income statements for meatballs alone
2. Cost of goods sold breakdown, including a waterfall chart
3. Break-even analysis, in terms of cows, meatballs, packages, and dollar amounts
4. Sensitivity analysis
5. *Pro forma* income statements including all prime cuts and meatballs

Major Findings

We found that with our recommended strategy, which is to secure and deliver our own cows to The processor, and purchase ground pork from The processor, could be profitable for Working Landscapes. With our estimated inputs, which can be seen in **Appendix III** as well as the financial tool excel document, we have had many major findings:

1. Net income estimate: $1,900 considering only meatballs (and not revenues from prime cut meat sales)
2. Break-even estimate: 10,721 meatballs, 1,071 packages, 2.2 cows, and $5,892 of sales
3. Sensitivity estimate: 50% is the approximate amount of meatballs WL has to sell to break even

Output pages such as the *pro forma* income statements and break-evens can be found in the tool in its entirety which is provided as a Microsoft Excel document. The *pro forma* is also shown in **Appendix IV.**

Supply Chain Framework

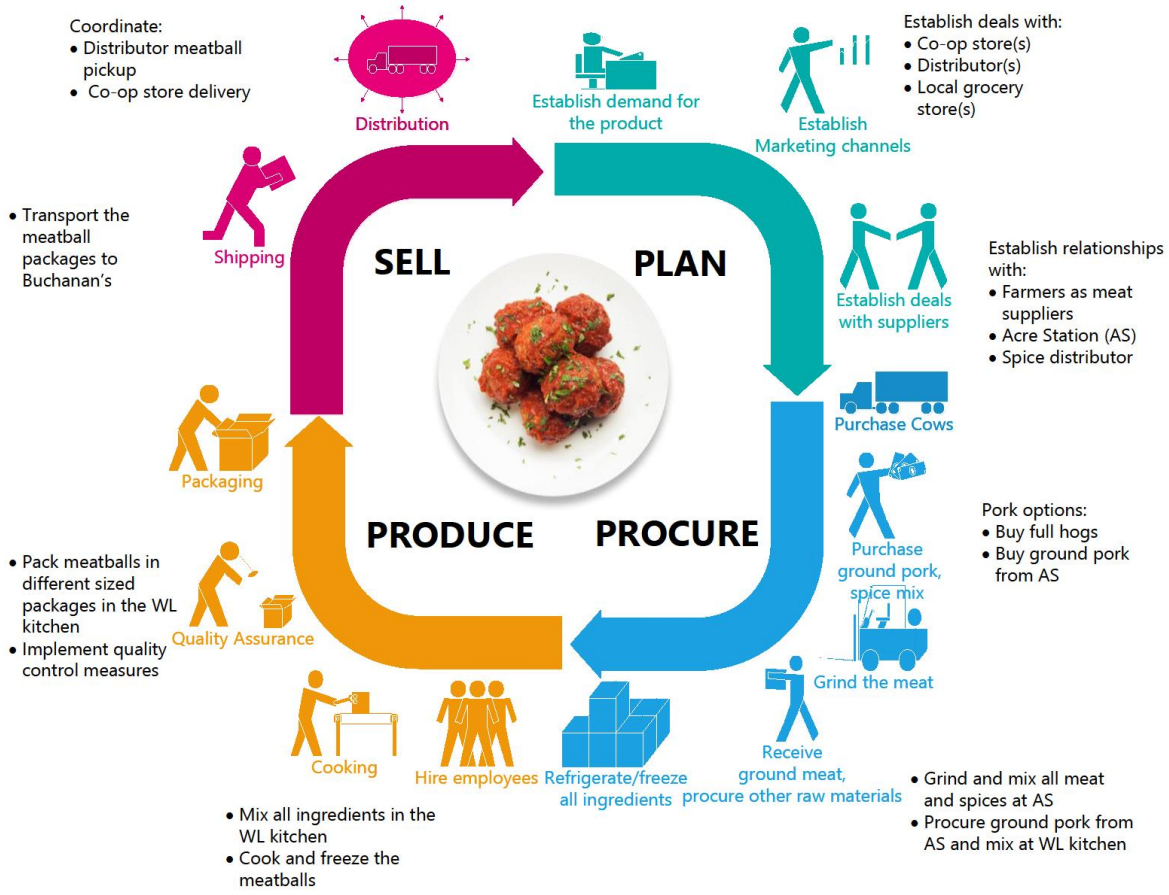
Overview

The supply chain framework was developed by taking the following steps:

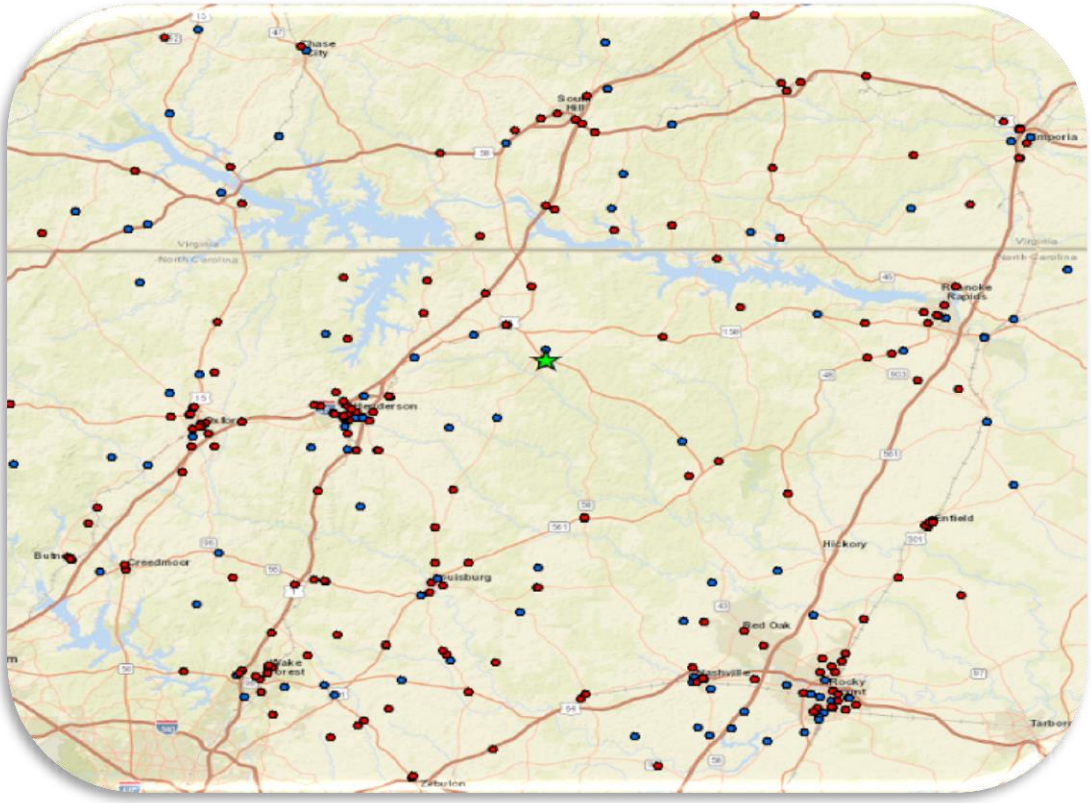
1. Call and interview potential suppliers and buyers
2. Create financial tool
3. Analyze financial tool outputs
4. Consider the mission of Working Landscapes as well as the maturity of this project
5. Consider the available connections, capital, and resources of Working Landscapes

When analyzing the financial tool outputs, we found that supplying beef but purchasing ground pork as opposed to whole hogs was the most financial and logical choice. This is a consequence of many factors. First, the financial tool estimates that this provides the largest net income and it requires Working Landscapes to sell only 50% of its meatballs. This is critical in the first year of the project, as we cannot be confident in sales projections.

Our visual supply chain framework can be used for the meatball venture or be adapted to similar future ventures and has explanations and choices incorporated at many points. The supply chain framework is pictured below:



Map of stores with similar NAICS codes within forty miles of Working Landscapes



Financial tool inputs for buying ground pork from the processor

REVENUE INPUTS		
Total percent of meatballs expected to go unsold	10%	
Total meatball size in ounces	1	
Number of meatballs in package #1	10	
Price of meatball package #1	5.5	
Percent of sales allocated to package #1	100%	
Number of meatballs in package #2	0	
Price of meatball package #2	0	
Percent of sales allocated to package #2	0%	
Number of meatballs in package #3	0	
Price of meatball package #3	0	
Percent of sales allocated to package #3	0%	
Number of ounces per pound	16	
Ounces of spice per meatball	0.05	

COW INPUTS		
Number of cows purchased annually	4	Annually
Pounds of ground beef from one cow	120	
Retail value of the ground beef	846	
Retail value of the other cow products	2473	
Number of ounces of ground beef to be used per meatball	0.4	

HOG INPUTS		
Pounds of ground pork from one hog	36	
Number of ounces of pork to be used per meatball	0.4	

COST OF GOODS SOLD INPUTS		
Cost per cow	2,136	
Cost of butchering/processing one cow	815	
Cost per pound of ground pork	1.69	
Transportation for one trip	124	
Spice distributor cost per how many pounds?	20	5
Added cost to create meatball mix per how many pounds	0	5
Packaging cost for one package	0.5	0
Ingredients (milk, eggs, parsley, etc.) per how many meatballs?	1.54	80
Other costs per how many meatballs?	0	80

SELLING EXPENSE INPUTS		
How many employees?	2	
At what hourly rate?	10	
How many meatballs can be made in one hour by the number of employees in B41?	300	
Payroll expenses	10%	
Advertising expenses	200	Annually
Additional depreciation	0	Annually
Cost of transportation (meatball related only)	500	Annually
Other costs	0	Monthly

GENERAL/ADMIN INPUTS		
Additional management salary/wage attributed to this project	0	Annually
Additional rent attributed to this project	0	Annually
Additional utilities attributed to this project	500	Annually
Additional equipment maintenance attributed to this project	0	Annually

OTHER INPUTS		
Tax rate	0%	
Extraordinary gain/loss	0	
What percent of cow prime cuts do you expect to be unsold?	20%	

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Financial tool output: *Pro forma* income statement for meatballs only

Pro Forma Income Statement

Working Landscapes, Project Meatball
For Different Livestock Options

REVENUE	Separate	Consolidated	Buy Pork
Gross sales	9,504	9,504	9,504
Less sales returns and allowances			
Net Sales	**9,504**	**9,504**	**9,504**
COST OF SALES			
Ground beef	2,708	2,708	2,708
Pork	1,138	1,138	730
Other meatball components	549	549	549
Packaging	864	864	864
Transportation of livestock	257	160	114
Salaries and wages	1,280	1,280	1,280
Other	-	-	-
Total Cost of Goods Sold	**6,795**	**6,698**	**6,244**
Gross Profit (Loss)	**2,709**	**2,806**	**3,260**
OPERATING EXPENSES			
Selling			
Advertising	200	200	200
Depreciation	-	-	-
Transportation of meatballs	500	500	500
Other	-	-	-
Total Selling Expenses	**700**	**700**	**700**
General/Administrative			
Salaries and wages	-	-	-
Payroll taxes	128	128	128
Rent	-	-	-
Utilities	500	500	500
Equipment maintenance	-	-	-
Total General/Administrative Expenses	**628**	**628**	**628**
Total Operating Expenses	**1,328**	**1,328**	**1,328**
Net income before taxes	1,381	1,478	1,932
Taxes on income	-	-	-
Net income after taxes	1,381	1,478	1,932
Extraordinary gain or loss	-	-	-
Income tax on extraordinary gain	-	-	-
NET INCOME (LOSS)	**1,381**	**1,478**	**1,932**