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Farm Business Management: A Localized Analysis of Financial Tools Utilized in Agribusiness

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Farm Business Management:

A Localized Analysis of Financial Tools Utilized in
Agribusiness

Honors Thesis

Abby Lamothe

ADMN 799H

Professor Hasseldine

Spring 2014

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1.0 Introduction to Farm Business Management

Farming is one of the longest established entrepreneurial ventures known to man. As a business, many decisions must be made and many metrics must be taken into consideration and measured. “In today’s world, farming is a complex business with many facets. From the traditional family owned farm to the corporate farm, bookkeeping, profitability, tax planning and many other skills are required to complement traditional farming duties” (Rothchild). Whether the farmer raises chickens for eggs or sunflowers for oil, an effective and efficient accounting system is essential for the long-term success of the business. The question then becomes evident: what data to measure and how to put it to use within the system.

1.1 Motivation for the Thesis

Starting in the fall of 2011, I joined the volunteer team at North Berwick Farmers’ Market. While working as a food stamp consultant, I met many farmers from around Maine and established a network full of farm educators and resources. Since my time as a volunteer, I have continued to work for the market and have also expanded to volunteering at other markets in New Hampshire.

While working at these markets, my interest in agriculture and farming grew deeper and I sought a greater understanding of their lives from a business perspective. During my fall 2013 semester I was enrolled in Advanced Managerial Accounting. One of the subjects we covered during this semester is joint costing. I was so intrigued by the milk example given in class that I approached Professor Hasseldine with my thoughts.

My work at local farmers' markets helped spark the connection between my volunteer interests and topics covered in the curriculum. From that initial brainstorm I realized I could work with local farms gaining a better understanding of their accounting systems. This is where the seed was sown and grew to the project which followed.

1.2 Background of the Topic

The financial records of the farmer can be used to make important decisions ranging from products to sell, to equipment to purchase. Without useful data, the business is unable to make sound decisions, which could ultimately affect the profitability and viability of the farm. Something as simple as selling eggs by the half dozen vs. dozen can be troublesome if the data doesn't support the decision.

As a result, farmers must determine what data is needed to make the best decision and then create a system which allows them to track such information.

Accordingly, very few systems (even in the same sub-industry) are the same or even similar. The process of creating an accounting system for a farm is a very organic process (no pun intended). The farmer usually works with their accountant and creates their system from the ground-up, something which isn't as common place in other industries.

Furthermore, it is important to understand that the building blocks of the system (income, expenses, inventory, depreciation, etc.) are all present, simply made more useful for the task at hand. One of the most surprising realizations I came to is how similar, yet different, the systems of some of the farms have been.

As mentioned above, the foundation of each system is similar, but the ways in which each farmer has been able to modify the inputs to make the outputs more meaningful is remarkable. To emphasize this, related topics will be covered for different farmers (such as inventory methods), and the similarities and differences between the methods will be discussed. This will help to show how many different systems can be created to successfully allow a farmer to attain desired metrics and data.

2.0 Literature Review

For the first few weeks of the semester, I spent time in Dimond Library researching sources from which to base my analysis. A majority of the resources included in the analysis were located in “storage” at the Library and date back to the 1920’s. As is to be expected, many principles of farming are long-established and well published in the marketplace. Refreshingly, however, new insight has been shed on the subject thanks to the advent of computerization. The sources utilized combine well-established practices and new systems created through spreadsheets and computer programs. The old and the new resources combine well to provide additional insight on the subject matter.

2.1 Data Gathering

During my senior fall semester I took Advanced Managerial Accounting. This is where the inspiration for my thesis began. Accordingly, I referred heavily to my class textbook during the beginning phases of the project. In addition to my textbook, I also referenced my class notes. Starting with the table of contents, I started to imagine how I would design my project. There were so many topics to choose from and knowing which (if any) would provide the type(s) of data I desired was quite daunting.

2.2 Selection of Relevant Subject Matter

As exhibits 1 and 2 (**listed on page 9**) show, my analysis focused on the following central topics: cost of feeding livestock, depreciation, budgets, cost allocation, spoilage / rework / scrap, pricing decisions, inventories, and customer

profitability analysis. Through referencing of my textbook, notes, and farm resources, these topics spoke well of both my understanding of managerial accounting, while also incorporating industry-specific analysis. The topics selected both kept me in my comfort zone, while also allowing me to explore the complexities associated with farm accounting.

2.3 Spreadsheet Creation

I found it incredibly helpful to organize my data gathering using two different directions: by farm and by topic. Listed in exhibit 1 is a data breakdown by farm. Exhibit 2 captures the same data but presents things differently, instead emphasizing the topics to be covered. By organizing the spreadsheet in this manner, extrapolating data became much more straightforward.

During certain portions of my analysis, the farms themselves were in the spotlight, while during others, the topics which we covered were centralized. Because of the data mining setup, understanding my objectives was simplified. Throughout the analysis, the below-listed farm spreadsheet was referenced. As explained above, depending on my objectives, a different way of looking at the analysis was necessary. The divide in topics and farms provided quick access and understanding when needed most.

| | A | B | C | D | E | F | G |
|----|-------------------|---------------------------------|---|-------------------|---------------------------------|---|---|
| 1 | | | | | | | |
| 2 | CHICK FARM | | | FLYING GOAT FARM | | | |
| 3 | | COST OF FEEDING LIVESTOCK | X | | COST OF FEEDING LIVESTOCK | X | |
| 4 | | DEPRECIATION | X | | DEPRECIATION | | |
| 5 | | BUDGETS | X | | BUDGETS | X | |
| 6 | | COST ALLOCATION | X | | COST ALLOCATION | | |
| 7 | | SPOILAGE, REWORK, SCRAP | X | | SPOILAGE, REWORK, SCRAP | X | |
| 8 | | PRICING | X | | PRICING | X | |
| 9 | | INVENTORIES | X | | INVENTORIES | X | |
| 10 | | CUSTOMER PROFITABILITY ANALYSIS | X | | CUSTOMER PROFITABILITY ANALYSIS | X | |
| 11 | KELLY ORCHARDS | | | COPPAL HOUSE FARM | | | |
| 12 | | COST OF FEEDING LIVESTOCK | | | COST OF FEEDING LIVESTOCK | X | |
| 13 | | DEPRECIATION | X | | DEPRECIATION | X | |
| 14 | | BUDGETS | X | | BUDGETS | X | |
| 15 | | COST ALLOCATION | X | | COST ALLOCATION | X | |
| 16 | | SPOILAGE, REWORK, SCRAP | X | | SPOILAGE, REWORK, SCRAP | | |
| 17 | | PRICING | X | | PRICING | X | |
| 18 | | INVENTORIES | | | INVENTORIES | X | |
| 19 | | CUSTOMER PROFITABILITY ANALYSIS | X | | CUSTOMER PROFITABILITY ANALYSIS | | |
| 20 | MEADOW'S MIRTH | | | RIVERSLEA FARM | | | |
| 21 | | COST OF FEEDING LIVESTOCK | | | COST OF FEEDING LIVESTOCK | X | |
| 22 | | DEPRECIATION | X | | DEPRECIATION | X | |
| 23 | | BUDGETS | X | | BUDGETS | X | |
| 24 | | COST ALLOCATION | | | COST ALLOCATION | X | |
| 25 | | SPOILAGE, REWORK, SCRAP | X | | SPOILAGE, REWORK, SCRAP | | |
| 26 | | PRICING | X | | PRICING | X | |
| 27 | | INVENTORIES | | | INVENTORIES | X | |
| 28 | | CUSTOMER PROFITABILITY ANALYSIS | X | | CUSTOMER PROFITABILITY ANALYSIS | X | |
| 29 | THE BISON PROJECT | | | | | | |
| 30 | | COST OF FEEDING LIVESTOCK | X | | | | |
| 31 | | DEPRECIATION | | | | | |
| 32 | | BUDGETS | X | | | | |
| 33 | | COST ALLOCATION | | | | | |
| 34 | | SPOILAGE, REWORK, SCRAP | X | | | | |
| 35 | | PRICING | X | | | | |
| 36 | | INVENTORIES | X | | | | |
| 37 | | CUSTOMER PROFITABILITY ANALYSIS | X | | | | |
| 38 | | | | | | | |
| 39 | | | | | | | |

Exhibit 1

| | A | B | C | D | E | F | G |
|----|---------------------------|-------------------|---|---------------------------------|-------------------|---|---|
| 1 | COST OF FEEDING LIVESTOCK | | | COST ALLOCATION | | | |
| 2 | | CHICK FARM | X | | CHICK FARM | X | |
| 3 | | KELLY ORCHARDS | | | KELLY ORCHARDS | X | |
| 4 | | MEADOW MIRTH | | | MEADOW MIRTH | | |
| 5 | | THE BISON PROJECT | X | | THE BISON PROJECT | | |
| 6 | | FLYING GOAT FARM | X | | FLYING GOAT FARM | | |
| 7 | | COPPAL HOUSE FARM | X | | COPPAL HOUSE FARM | X | |
| 8 | | RIVERSLEA FARM | X | | RIVERSLEA FARM | X | |
| 9 | DEPRECIATION | | | SPOILAGE, REWORK, SCRAP | | | |
| 10 | | CHICK FARM | X | | CHICK FARM | X | |
| 11 | | KELLY ORCHARDS | X | | KELLY ORCHARDS | X | |
| 12 | | MEADOW MIRTH | X | | MEADOW MIRTH | X | |
| 13 | | THE BISON PROJECT | | | THE BISON PROJECT | X | |
| 14 | | FLYING GOAT FARM | | | FLYING GOAT FARM | X | |
| 15 | | COPPAL HOUSE FARM | X | | COPPAL HOUSE FARM | | |
| 16 | | RIVERSLEA FARM | X | | RIVERSLEA FARM | | |
| 17 | BUDGETS | | | PRICING | | | |
| 18 | | CHICK FARM | X | | CHICK FARM | X | |
| 19 | | KELLY ORCHARDS | X | | KELLY ORCHARDS | X | |
| 20 | | MEADOW MIRTH | X | | MEADOW MIRTH | X | |
| 21 | | THE BISON PROJECT | X | | THE BISON PROJECT | X | |
| 22 | | FLYING GOAT FARM | X | | FLYING GOAT FARM | X | |
| 23 | | COPPAL HOUSE FARM | X | | COPPAL HOUSE FARM | X | |
| 24 | | RIVERSLEA FARM | X | | RIVERSLEA FARM | X | |
| 25 | INVENTORIES | | | CUSTOMER PROFITABILITY ANALYSIS | | | |
| 26 | | CHICK FARM | X | | CHICK FARM | X | |
| 27 | | KELLY ORCHARDS | | | KELLY ORCHARDS | X | |
| 28 | | MEADOW MIRTH | | | MEADOW MIRTH | X | |
| 29 | | THE BISON PROJECT | X | | THE BISON PROJECT | | |
| 30 | | FLYING GOAT FARM | X | | FLYING GOAT FARM | X | |
| 31 | | COPPAL HOUSE FARM | X | | COPPAL HOUSE FARM | | |
| 32 | | RIVERSLEA FARM | X | | RIVERSLEA FARM | X | |
| 33 | | | | | | | |
| 34 | | | | | | | |

Exhibit 2

2.4 The Wiswall Analysis

Both Kelly Orchards and Meadow's Mirth utilize crop budgeting to gain a better understanding of their businesses. Josh Jennings from Meadow's Mirth provided me with a copy of his Wiswall template for mesclun. At first glance, this template seemed overwhelming. Interestingly enough, however, the way in which these templates are created makes data tracking incredible user-friendly. The templates can be as user-specific as desired, because Wiswall includes industry standards where / when tracking data can be more complicated. As a result, if a farm is having a hard time specifying certain metrics, relying on the Wiswall figures allow for analysis to continue.

As farms become more advanced, Wiswall metrics can be substituted for business-specific findings, increasing the usefulness of the output. As Josh and Meadow's Mirth Farm have realized, the more input they enter from their findings, the more they realize about their business. In the interim, reliance on the Wiswall figures allows for a basic understanding of the business. Additionally, as business specific metrics are determined, the farm can compare their findings with industry standards. The layers of insight able to be derived from these templates have proven indispensable for many who utilize them. While farm business templates have been around for decades, the advent of computerization has added a level of simplicity to the process. Wiswall templates are included on a CD-ROM contained within the purchased book.

2.5 Sources Used

While few direct citations were used within my analysis, it is important to gain an understanding of how I utilized the resources available to me. Listed below are the library resources I referred to during the beginning steps of my analysis. These texts provided me with direction and allowed me to gain a better understanding of the importance of farm accounting. Additionally, knowing what was important in terms of data gathering was incredibly important. The resources listed below are reported in terms of author. From there, the topics covered in each text are explained, in addition to the information used to further my work.

- **How To Farm For Profit: Practical Enterprise Analysis , Donald M. Fedie, with The Collaboration Of Michael H. Prosser, CPA, 1997**
 - Identification of common denominators, crop enterprise analysis, and livestock enterprise analysis
 - Rather than being templates, the crop and livestock enterprise analyses were completed using industry examples. Through analysis of these examples, a better understanding of the farmers' systems was gained.
- **Farm Records And Accounts , J. Norman Efferson, 1949**
 - Understanding the basics of farm accounting, the importance of farm inventory systems, development of farm inventory systems, budgeting, crop enterprise analysis, livestock enterprise analysis
 - Provided examples of labor tracking systems, and basic templates for tracking receipts, expenses, and depreciation.

Considering this book was from 1949, it complements the modern analysis of templates through spreadsheets in the Wiswall Analysis discussed below.

- **Farm Accounting: Principles And Problems, Karl F. McMurry And Preston E. McNall, 1926**
 - The importance of farm bookkeeping, farm inventory systems, examples of journals and journal entries for farm purposes
 - Solidified the connection between general understanding and industry-specific applications, helping to tie together my experience in the field and in the classroom
- **Farm Accounting, H.T. Scovill, 1918**
 - Cost accounting in farming, explanation of industry-specific terminology, illustrations and examples from the industry
 - Helped to foster a greater understanding of industry-specific terminology and explained through example certain industry practices.
- **The Organic Farmer's Business Handbook : A Complete Guide To Managing Finances, Crops, And Staff--And Making A Profit , Richard Wiswall, 2009**
 - Crop enterprise analysis, budgeting, effective marketing strategies
 - Through use of modern technology, Wiswall has been able to make templates more easily accessible and more user-friendly. Since a few of the farmers utilize his crop budget

templates, having access to the explanations of the templates made analysis more intuitive.

3.0 Methods

Because of the nature of my project, my research methodology was very hands-on. While I used the internet and library resources to obtain general background information, I spent the majority of my time with the farmers conducting on-site research and forming analyses. Throughout the entirety of my research, I traveled to visit the farmers in a location of their choice. These choices were either their home, place of business, or a local café. Nearly all meetings occurred at the farms themselves and allowed for multidimensional analysis. Many times, after the interview was complete, I would travel the farm with the farmer to observe day-to-day happenings and see the business as they do.

By interacting with the farmers and their business on-site, my understanding became deeper and allowed for more effective analysis from that point forward. I was able to listen to explanations and see firsthand exactly what was described during our interviews.

3.1 Selection of Farms

My initial farm listing contained over a dozen New Hampshire and Maine farms. I was hopeful that many farms would be interested in the project I sought to complete. I started by brainstorming the farms from North Berwick Farmers' Market. My history at North Berwick Farmers' Market helped spark the interest I now have for sustainability and local agriculture. This initial experience helped land me where I am today.

While volunteering at North Berwick Farmers' Market, I met many farmers from varied backgrounds who seemed willing to help. Product lines at North Berwick Farmers' Market ranged from raw milk, local eggs, goat cheese, to pasture-raised bacon and pork products. I knew it would be too good to be true that all farmers at this market would be willing to help with the project. As a result, I expanded my search to my contacts at Seacoast Eat Local.

After volunteering at North Berwick for a few months, I decided to then volunteer for a Seacoast Eat Local market as a food stamp consultant, just as I had done at North Berwick. While at the Seacoast Eat Local market, I met even more farmers and was exposed to an even vaster array of possibilities. At this market farmers raised wool, bison, chickens, and so much more. The Seacoast Eat Local and North Berwick Farmers' Markets were the channels through which I found all the farmers.

Out of the twenty farmers I reached out to, I had two farmers turn down my offer, three expressed interest, but ended up being too busy, and seven farms joined me in my research process. In the end, one farm had to drop out due to illness, but given the initial data collected, their participation was very helpful.

In choosing the farms to recruit, I made sure to look for varying product lines and locations. The farms I ended up working with came from both New Hampshire and Maine and produce distinct products, allowing for additional analyses. During the following subsections I provide background information regarding the farms included in the proceeding analysis.

3.11 Chick Farm

Chick Farm is a small family farm located in Wells, Maine. Rick and Marilyn Stanley raise certified organic eggs, meat birds, berries, and vegetables. For a majority of the business tasks, Rick and Marilyn work without additional staff. During the chicken processing season, however, additional family members provide assistance. Their niece Brandy and family friend Harold take part in the poultry processing and lend a hand wherever is needed.

The history of Chick Farm spans back hundreds of years. In the early days, the property was used as a homestead and functioned as a large-scale egg producer. Waldo Chick focused his business mainly on chickens and sold off the remaining dairy cattle from the homestead established prior. His operation contained over 6000 laying chickens, classifying him as a large-scale producer. For roughly 250 years, the property was used in this way.

Marilyn's family became involved when she was young. Waldo Chick had become well known in the area for his chicken barbeques. In the 1950's, Waldo's barbeques were so heavily in demand, he sought additional help. Marilyn's family lived close to the farm and her grandparents, her father, and her uncle began assisting with the chicken barbeques. When illness struck Waldo's family a few years later, he hired Marilyn's grandparents to tend the farm. A few years later, Marilyn's father built a house on the farm where she and her family lived. When Waldo retired in the coming years, the MacDonald family took over the barbeque business.

In 1975, the egg production came to a halt and the land became vacant. When Waldo passed away in 1988, Marilyn's parents purchased the farm. After Marilyn's mother passed away, Rick and Marilyn purchased the land from her father. At that point, the farm was non-functional and had been idle for many years. They worked very hard to ensure that the land would remain farm land and looked to ensure it would be protected from developers. In 2001, Rick and Marilyn revived the land and began growing chickens and crops.

Since the revival, Rick and Marilyn opened up a short-lived farm stand and began a CSA (community supported agriculture) program. Due to health reasons and reassessment of goals, the CSA program was discontinued. While both Rick and Marilyn enjoyed having these sales channels, both agreed that the amount of input was not worth the ending outputs received. Since then, the two have become well known at the local farmers' markets and sell their MOFGA certified organic eggs and meat birds through this channel. At present, Rick and Marilyn agree that their current sales channels will be sufficient for the scale of the operation which exists at the moment. Until or unless they scale up or down, additional sales outlets would be cumbersome for the couple.

3.12 Riverslea Farm

Riverslea Farm has a long history in New Hampshire and is located in Epping, New Hampshire. As a working farm for over 200 years, it is now considered a "NH Farm of Distinction". Liz and Jeff Conrad acquired the farm in 1991 and have been raising meat animals for both consumption and value-added products ever since. Primarily, their animals are intended for meat, skins, and wool. At

present, Liz and Jeff are raising sheep and goats for consumption, as well as the various other products produced. They are selling their products through farmers' markets as well as their on-site shop.

Last year, Riverslea Farm welcomed Jeremiah and Nicole Vernon as partners in an effort to expand the farm. Jeremiah has had a passion for farming for years and is now looking to expand the product line of the farm through adding meat chickens and vegetables. At present, Jeremiah has already completed a successful season of broiler chicken production and is looking forward to another bountiful season. In the coming months, Jeremiah looks to expand further by starting his organic vegetable crops.

Liz and Jeff were unable to participate fully in the analysis phase of this project as a result of a crowded schedule. Thankfully, however, their insight and connections allowed for the analysis of Jeremiah's operations.

3.13 Kelly Orchards

Kelly Orchards is a family farm located in Acton, Maine. Founded in 1982, Arthur Kelly and his wife Jill live on the farm and have successfully grown numerous crops over the years. In terms of crops, Kelly Orchards specializes in tree fruits, while also growing berries, pumpkins, and squash. Their tree fruits consist of apples, peaches, and plums.

Kelly Orchards utilizes Integrated Pest Management (IPM) practices and is well known for their wonderful fruits and products. For value-added products, Kelly Orchards also produces cider during the apple season and provides Pick-Your-Own (PYO) events for their apple crops. Arthur Kelly staffs his orchard

through multiple channels, ranging from hiring local high school students to employing Jamaican nationals who travel for work during the season. At present, Kelly Orchards sells their products through wholesale and retail channels and is quite active in the farmers' market community.

Arthur Kelly monitors his product lines closely to ensure that the right crops are grown, given the land available. Each season, Arthur pulls a crop and grows a new variety. By modifying product lines annually, Arthur hopes to be better able to serve his customers. During the past few seasons, he has been confident in his selections and has been successful in locating distributors and proper outlets through which to sell his products.

3.14 Meadow's Mirth

Meadow's Mirth is a small organic farm located in Stratham, New Hampshire. At present, Meadow's Mirth is a four-season farm, meaning there are crops produced and sold during each month of the year. Because of the ever-changing New England weather, this can be challenging. They currently sell their products through both retail and wholesale channels, focusing primarily on sales through farmers' markets. In addition, they sell to restaurants, have a CSA (community supported agriculture) program, and have a self-serve farm stand on-site.

Josh Jennings is the face of the farm and handles most farm business. He has worked hard to produce dozens of crops per season and emphasizes the importance of the community. His work partners with that of many other local organizations such as Seacoast Eat Local, Seacoast Growers' Association, Slow Food Seacoast, and New Hampshire Farm to School. Josh and his team also work

closely with Victory Bees to ensure proper pollination of their crops. The business hopes to become more efficient as time goes on and perfect the practices they have in place.

At present, the wholesale side of the business is being re-worked to better serve the needs of the restaurants and wholesalers who purchase the farm's products. Josh feels that while these changes are difficult to implement, the outcome will be well-worth the effort.

3.15 Coppal House Farm

Coppal House Farm is a family-friendly farm located in Lee, NH. Focusing on many different products and attractions, Coppal House Farm raises chickens for eggs and meat, pigs, lamb, and hosts a corn maze and sleigh rides seasonally. Since the property is so large, housing many product lines is straight forward.

Because of their diversification with the corn maze and sleigh rides, this farm is now functional all year long and provides fun for the whole family. Meat and eggs can be purchased on-site or at one of the many farmers' markets which they partake in.

3.16 Flying Goat Farm

Flying Goat Farm is a small family operation located in Acton, Maine. Married Couple Devin and Cara run the cheese making and animal husbandry sides of the business, respectively. Both Devin and Cara come from backgrounds other than farming and through their experiences as farmers, they have realized their life mission.

Devin grew up in the marine / fishing industry and spent quite a few years helping his family with their commercial fishing operation. Cara was formerly an art teacher. After helping with the kidding, she realized her true calling in life: animal husbandry. Cara is now part of the Class of 2016 at Tufts University in Massachusetts, studying veterinary medicine.

Flying Goat Farm is well known for their artisanal cheese, both hard and soft. In addition to their expansive cheese line, the couple also raises pasture-fed pork. As they like to say, pigs are a great addition to a dairy farm. The “waste” products from cheese making are safe for consumption and the pigs love it! Naturally, as they mentioned, this combination simply makes sense.

Devin and Cara can be found selling their products through many different channels throughout Maine. At present, they participate in numerous farmers’ markets in the state and supply restaurants with their cheeses and meats. Since both Cara and Devin are incredibly busy both on and off the farm, they do not run an on-site farm stand.

3.17 Bison Project

Bison Project is a community project started by Conor Guptill and his business partner. The project is located in Berwick, Maine at Hackmatack Farm. Unlike a traditional farm, Bison Project is centered on principles, rather than motivated by profit. The driving forces of this project are as follows: sustainability, conservation, education, and community. Through continued focus on these principles, Conor and his business partner make decisions which are best suited in meeting these objectives.

While the project is small at present, given the land available, increased expansion is possible and likely in the future. Conor and his team are currently selling their animals through retail channels at farmers' markets and are excited to see what the future brings.

3.2 Initial Communications

Throughout the whole process, I have made sure to keep detailed notes of each time I have made or attempted to make communications with a farmer. Within this log, I have taken note of the date of communication, method through which communication was established (telephone, email, etc.), and the result (if any) of the communication achieved.

Since I have an established relationship with roughly half of the farms, picking up and starting a new conversation came with ease. Four of my seven farmers, however, were brand new relationships. As a result, determining the proper means of communication and the preferred means / times of communication with these farmers proved more challenging.

At first, email was my primary means of communication. After the first few weeks with little response, I reached out via business Facebook pages. In the end, I resorted to phone communication when these other channels proved unsuccessful. Thankfully, once I was able to elaborate on my objectives, many of the farmers opened up and provided additional contact information and preferences.

3.3 First Interviews

Once my thesis topic was approved, I began recruiting farms, as explained above. My first interview occurred on Thursday, December 12th, 2013 at 10 AM with Meghan of Coppal House Farm, on site at their farm.

Coppal House Initial Interview

During this interview, Meghan and the lead farmer helped me gain a better understanding of the product lines they produce and the objectives of the farm. I learned that at present, Coppal House Farm is the only canola grower in the state. Also, all of their sunflowers are grown for the sole purpose of producing oil. Since they are the only growers in the state, they have leverage in terms of pricing.

In terms of animals and crops, Coppal House Farm raises pigs, layers, broilers, sheep, draft horses, and a multitude of vegetables. Their meats and vegetables are sold at many farmers' markets in addition to their on-site farm store.

The farm is also well known for the attractions they host. During the fall, Coppal House runs a corn maze which is family-friendly. In the winter and early spring, they also have draft horses which pull sleigh rides throughout the property. Through these two sets of attractions, Coppal House is now a four-season operation for the public.

During our initial interview, Meghan mentioned a few areas to focus on: tracing of costs for the pigs and chickens. Accordingly, the following analysis will be central to these themes.

Chick Farm

On Thursday, January 16th, at 10:30 AM, I conducted my first interview with Chick Farm, on site at their farmhouse. I was given a tour of the chicken house and chicken processing facility. I also saw the fields where the chicken tractors are brought and the plots where the crops are grown.

Marilyn started the interview with a story about the history of Chick Farm. As explained in the preceding section regarding farm selection, Marilyn grew up on the farm. At the time, it was a poultry farm and had been for over a century. With material costs going up and egg prices remaining stagnant, the farm needed to diversify.

Since purchasing the farm in the early 1990's, Chick Farm has dabbled with CSA's and a farm stand. They are now MOFGA (Maine Organic Farmers and Growers Association) Certified Organic and are able to sell their eggs, chickens, and vegetables with this seal. In addition to gaining organic certification, Chick Farm has found other ways to add-value for customers, including on-site processing.

Chick Farm has a license to process chickens on-site for the given volume of chickens which they produce seasonally. By processing on-site, they can manage costs more effectively and provide customers with piece of mind. Because of the high costs associated with processing, Rick and Marilyn decided it was necessary for them to be in control of this segment and monitor closely the "make or buy" decision this entailed. At present, the couple feels strongly that processing on-site is the best monetary and ethical decision for their business.

Both they and their customers appreciate the transparency when it comes to the end-of-life procedures for their food.

In terms of crops, Rick and Marilyn are raising numerous vegetables which are well-suited for their sandy soil. Crops such as potatoes, garlic, onions, sweet potatoes, and asparagus do well with their soil composition. For fruits, raspberries and other perennials are best suited and allow for hand-tending during the harvest.

For the following analysis, Rick and Marilyn expressed interested in gaining understanding regarding actual labor costs. At present, the labor of Rick and Marilyn is estimated and there is little tracking of hours spent working. As a result, creating an easy, efficient system of labor tracking would help improve the quality of their recordkeeping.

Riverslea Farm

My First interview with Liz and Jeff took place on Tuesday, January 7th at 10 AM, on site, in their kitchen. During the interview, Liz mentioned the new business venture they had begun last season: partnering with Jeremiah Vernon to increase products and expand the farm. Liz explained clearly the nature of the relationship between the two farm couples.

Jeremiah Vernon and his wife, Nichole are partnering with Liz and Jeff to add variety and growth to Riverslea farm. Liz explained that the space utilized by the Vernon's is paid for through labor. As a result, money rarely changes hands until Jeremiah and Nichole work more than the hours necessary to satisfy their rental obligation.

As a result of a very busy schedule, Liz and Jeff explained that scheduling additional interviews may be difficult or impossible. Accordingly, we focused our initial meeting on explaining the current state of the farm and the place in which Jeremiah and his operation fell. I was able to gain important information in order to pursue the following initial interview with Jeremiah.

On Saturday, January 25th, at 12 PM, I conducted my first interview with Jeremiah Vernon at Riverslea Farm in the farmhouse kitchen. After speaking with the Conrad's a few weeks prior, I learned how perfect the Vernon's would be for my analysis.

Jeremiah explained the layout of his business and the assets necessary to get everything in place. Given the space allotted to him through his rental agreement, he is able to raise chickens in batches of 1000 and processes the chickens every seven weeks.

Nearing the end of the interview, Jeremiah explained his hopes for the business in the future. At present, he is raising chickens for meat and has limited other products (including prepared chicken meals). In the future, he hopes to raise vegetables and purchase additional assets to foster continued expansion. In the long-run, Jeremiah and his family are looking to purchase Riverslea Farm from the Conrad's. As long as business continues to progress steadily, Jeremiah feels confident that this transfer of ownership can occur and can happen in a mutually beneficial fashion.

Kelly Orchards

On Friday, January 17th, at 10 AM I conducted my first interview with Arthur Kelly, on site, at his orchard. We spent nearly three hours walking through his orchard discussing varieties, techniques, and his plans for the business in years to come. I was able to see dozens of rows of apples, peaches, plums, and a pumpkin patch.

Art also showed me his rows of grafted trees. He explained the importance of tree grafting and how this process has been instrumental in his cost reduction practices. Since the process requires minimal supplies and less than an hour of labor per tree, the cost savings can add up tremendously when compared to purchasing a new seedling. As long as the grafts from last season take, Art will have saved hundreds, if not thousands, this season alone, simply by grafting vs. purchasing his trees.

Meadow's Mirth

The first interview with Josh Jennings of Meadow's Mirth was completed on Monday, January 20th at 10 AM at White Heron Tea Company. During the discussion, we talked of his hobby animals and the lengthy list of crops he grows each season. The root vegetables he grows each winter allow him to be a four-season operation.

While Meadow's Mirth is best known for their vegetables, Josh keeps both pigs and chickens on the farm. The hog operation is small and Josh explained that while the animals assist in the cycle of the farm, they are mostly viewed as hobby. Additionally, over 100 broiler chickens are kept seasonally. Unfortunately, the

cost of feed has continued to rise, making Josh reconsider raising chickens. Because of this uncertainty, the pigs and chickens will be negated from the following analysis.

Some of the most important topics for Josh during this interview were gaining a better understanding of time allocation and time management. As explained above in the Chick Farm initial interview, tracking of labor hours can be cumbersome for farmers. Josh and his crew have also had difficulty in properly tracking time spent completing tasks. As a result, Josh expressed interest in developing systems for tracking this data properly.

Flying Goat Farm

My first interview with Cara of Flying Goat Farm occurred on Sunday, January 19th, at 10:30 AM, at Adele's Coffee House in Dover, NH. During our interview, we discussed the evolution of the farm, both her and her husband's roles, and their thoughts for the future of the farm.

A few years ago, Cara and her husband Devin were given an incredible opportunity. A local dairy farmer was retiring and was looking to liquidate and transfer the assets and property. Through sponsorship of a Kickstarter Project, Cara and Devin were able to purchase over \$100,000 worth of dairy equipment. While investing heavily in a new dairy was not planned for quite a few years, the opportunity was far too good to pass on. They now have a state-of-the-art facility and can better produce their product.

Another investment the couple chose was in starting a pork operation. While their pasture-raised pork is non-central to the business, pairing cheese-

making and pork growing melds perfectly. A majority of the dairy waste from the cheese-making can be safely eaten by the pigs and supplements their diet. As a result, an otherwise “waste product” is now fully utilized and enjoyed by the pigs.

At present, the central focus of the business is their cheese-making. In order to make this cheese, the goats must be well nourished and cared for. Devin works with their hay producer to negotiate pricing and does all the labor to collect the hay and then doesn't have to pay for it. Under such an agreement, feed costs can be greatly lessened. While other feed products are necessary to satiate the goats, mitigating hay costs has dramatically helped reduce cash tied up in feeding their goats.

Cara and Devin currently use bagged grain, but are looking into purchasing a silo. While this may require a hefty upfront cost, Cara is willing to make this decision, given that the nutritional components of the feed are not compromised. Cara is interested in gaining more information about any nutritional changes that occur after storing grain in this manner. Accordingly, the decision to invest in the silo is on hold until further information is attained.

Cara and Devin's cheese is one of the most popular local goat's cheeses in the region. As a result of this, demand is often greater than supply. They are considering ways to expand, but with their hectic schedules, many other matters are more pressing.

They have a lot of value-added products including goat cheese, cow cheese, and pasture-raised pork. They decided against selling their raw milk, since

it costs about \$30 a gallon, raw. The most value can be derived by processing the raw milk further, in to yogurts and cheeses.

The dairy production at Flying Goat Farm involves 20 goats for milk. Eventually, they would like to raise 20-30 goats for milk, which would bring them to maximum capacity, given their space and equipment. They retain all of their doe kids, and typically, 20 goats will produce 40 kids. In the long-run, they would like to start showing their animals at different events. In order to begin this process, Cara and Devin would need to research effective channels through which to show their animals. Both agree that by having show animals, their customers will value their products with more esteem.

Cheese making requires a lot of inactive prep time. As a result, tracking exactly how much time is required to produce each variety of cheese is limited. With the cows' milk cheese they have done a lot of cost analysis, allowing them to have a better understanding of traceable costs. With their goat products, however, they have not done as detailed of an analysis to understand the costs involved. The couple knows such analysis is necessary if they wish to improve management processes and data tracking.

Meat goats are also raised on the farm. These goats are born in March and April and are raised for 6 or 7 months, depending on many different factors. The determination is based on how many are weather kids, which are preferable. The farm would like to be as diversified as possible, which motivated the decision to expand further than simple dairy operations.

Cows' milk cheese was another way they decided to diversify. Devin has been making cheese from milk from local cows for a few seasons now. The farm purchases the raw milk from local farms and then processes it into cheese. Eventually, the farm may invest in a few cows, but the couple knows this is at least a few years down the line. The equipment used for their goats could easily accommodate cows as well, making for an easy transition. Since the costs of the raw milk still allows for this product line to be profitable, they will continue to source the milk externally for the time being. Because blended cheeses are popular, these have been their focus for the cow's milk cheese production.

The pigs at Flying Goat Farm have been a small source of income, when compared to their cheeses. They have a breeding pair on the farm, allowing them to do all the mating on-site. This helps reduce costs each season during production. Cara and Devin have 12 piglets at the moment, and the mother pig is due again soon. Through wholesale and retail channels they manage to sell all parts of the pigs, helping to mitigate waste.

Staffing decisions have proved incredibly difficult for the farm. Both Cara and Devin are incredibly busy both on and off the farm, with off-farm commitments taking up much of their time. When at the farmers' market, they have had to decide whether to go themselves, hire an employee, or hire an independent contractor. In any case, costs or opportunity costs are incurred, complicating the decision. At present, either Devin or Cara staff the farmers' markets and tend to the wholesale accounts. As things get busier, they may need to explore additional staffing options.

Farmers' Markets and restaurants are the main channels through which they sell their products. Sales vary from market to market, and they would like to have a better understanding as to why this variance exists. In terms of restaurant relationships, they currently sell to Federal Jack's Shipyard. The couple is interested in analyzing sales by market and by restaurant to see how profitable (if at all), these ventures are for them. Cara and Devin have been in talks with Whole Foods and hope to eventually sell their full product lines within their stores. Scaling their operation to meet the needs of these stores may prove difficult, so additional consideration by Cara and Devin must happen before moving forward.

Within the analysis, Cara and Devin were interested in looking at Inventory, batch sizes for their cheeses, pricing decisions, and the cost of raising their kids. Within this comes a very interesting question: should the kids drink goat milk, cow's milk, or a formula substitute? Raw goat milk costs \$30 / gallon while raw cow milk costs \$5 / gallon. The question then becomes whether this substitution decreases cheese / milk quality. Additionally, does this affect the end product and which choice is best for the business? The question of milk choice for the kids will be central to the analysis of Flying Goat Farm.

Bison Project

The first interview with Conor Guptill of Bison Project was completed on Thursday, January 9th at 3 PM, at White Heron Tea Company. Bison Project is different from the other businesses I am analyzing, specifically because the main objectives revolve around principles, rather than profit. As explained by Conor, while the money is nice, the main idea of the project is much bigger than dollar

signs. As a result, Bison Project does not classify itself as a farm, but instead a community enriching “project”.

Conor and his business partner raise eighteen bison at Hackmatack Farm in Berwick, Maine. These animals are all at different life stages and 3-4 animals are born each year. All the births occur naturally on the property with no human intervention. Eventually, the pair hopes to increase the number of births from 3-4 up to 6-7 each year. Given the space they have (30 acres of land) and multiple pastures they have created, increasing births would allow the project to reach maximum capacity.

The project started with 16 animals, had some births, and also lost 2 animals to parasites. Growth of the project takes time, but as explained above, rapidly expanding is not a top priority. Conor knows what his land can handle and knows that growing will be a gentle process over the next few seasons.

Farmers’ markets are currently the predominant channel through which Bison Project sells their products. Roughly 80% of their sales occur through retail channels, with the remainder occurring through wholesale and “share” sales. When selling at wholesale prices, it is 10% off of retail, and shares can be purchased in various increments. Common shares are 1/8 shares or 1/4 shares. Customers are encouraged to choose share sizes which best fit their needs. The project also sells processed animals. Just as a cattle farmer sells parts, Conor and his partner process their animals in a similar fashion.

Possibilities for expansion are limited, given the small parcel of land they hold. A bison requires 1 square acre in order to thrive. Given the 30 acres secured

by the project, a maximum of 30 animals could be raised on the land. Currently, Conor and his partner agree that this would be the extent of the project, not looking to grow more than this capacity, even through additional purchasing of land.

The feed composition of the bison is incredibly straight forward: grass and hay. The bison are fed grass on an open pasture for 6 months of the year. For the remainder of the year, the animals eat hay. Conor ensures that all hay purchased for the bison comes from within a 5-mile radius. These two products are the only feed given to the bison.

In terms of hay choices, Conor utilizes both square and round bales. Square, 40 lb bales are utilized whenever possible, thanks to their easier mobility. These bales cost between \$4 or \$5 per bale and the animals eat 6 or 7 bales per day. In a year, this equates to 1260 hay bales per year. In total, this means \$5000 is spent each winter to feed the bison this type of hay.

Round bales are another option for the project. These bales are much heavier, and substantially larger. As a result of their weight and size, round bales require heavy equipment to move. Currently, the project does not own any heavy equipment, meaning extensive labor is required when transporting such feed products. These bales are also notorious for excess waste. These bales incur 20% waste right off the top. Waste is attributed to mold and mildew from outdoor storage. Unfortunately, storing these bales indoors takes up too much valuable space and leads to cumbersome waste. Waste can be reduced through wrapping the bales, but Conor chooses to do without the wrap because of the additional

waste products produced by the leftover plastic wrap. This type of waste goes against the objectives of their project, so they have chosen square bales as the predominant hay source for their animals. While round bales are used, it is minimal and not preferable.

3.4 Second Interviews

Chick Farm

My second interview with Rick and Marilyn occurred on 2/21/14 at 10 AM, on site. Throughout our interview, we chose to focus on the following topics: cost of feeding livestock, depreciation, budgets, cost allocation, spoilage and waste, pricing, inventories, and customer profitability analysis. The following interview notes show how the interview progressed.

Cost of Raising Livestock- Layers

Feeding the Laying Chickens

The laying chickens are fed a layer pellet because they need more calcium in order to produce eggs. In addition to this grain diet, organic food scraps are given to the birds. The chickens love to eat watermelon, fruits, vegetables, and sprouted barley, which Rick and Marilyn grow in their cellar. The watermelon, fruits, and vegetables are given to the birds when leftovers occur within the household. This sprouted barley is grown specifically for the consumption of the layer and broiler chickens. During the winter months, finding greenery for the birds to consume is difficult. To mitigate this, Rick and Marilyn have chosen to grow this lush, nutritious plant within their basement.

A small bin of sprouted barley takes roughly 8 days to grow from seed. Each day, the chickens, both layers and broilers, are given pieces from that day's barley bin. As I noticed during my visit to the farm, the birds love having the barley within their diet and enjoy this addition to their mealtime. In order to grow this barley, they simply must purchase the seeds and the growing containers. The growing containers are recycled and reused, once the chickens have been fed. This helps lessen costs and improve efficiency.

During the warmer months, the birds are pastured whenever possible. During some seasons, like winter, the birds are fed hard-boiled eggs. During the winter months, selling all of the eggs produced on the farm can be difficult. As a result, many eggs are left uneaten and potentially could go to waste. To mitigate this waste, Marilyn hard boils the leftover eggs, mashes them up shell and all, and feeds the product to the birds. The chickens love this source of calcium and the taste too.

The problem with feeding the chickens their own eggs results from the birds recognizing that the eggs they are laying are what create the tasty mash they are fed near dinnertime. As long as the birds are unable to associate the eggs they lay to the egg mash of their dinner, including these leftovers in their diet is unproblematic. Once or if the birds recognize the connection, this could lead the chickens to cannibalize their own eggs because they have developed a taste for them. As a result, Rick and Marilyn carefully monitor how they prepare the hard-boiled eggs and make sure to watch the behavioral patterns of their chickens.

At present, the birds are allotted a tasty treat which help supplement them with calcium and mitigates waste. During the summer months when egg production is higher and demand in the marketplace is also higher, very few eggs are left over. During these times, hard-boiled eggs are only served to the chickens when such leftovers exist. Using this system, no egg is ever wasted. It takes 20 weeks for a laying chicken to become productive and begin laying eggs.

Organic Certification

Rick and Marilyn are MOFGA certified organic. By being certified organic through MOFGA, you are also considered USDA certified organic. The USDA itself does not certify or attest to anyone's organic certification. Instead, agencies enforce and abide by the criteria used by the USDA to deem a business certified organic. As a result, Rick and Marilyn can claim both organic certifications on their products.

In order to become organically certified, a business must use the income matrix provided on the MCS certification form to determine how much it would cost to be certified organic. Thankfully though, the state will reimburse and provide a rebate for some of the costs associated with gaining organic certification. Also, for small businesses and startups, both the state and the organization providing the certification will provide a rebate almost entirely covering the cost of certification. The reason why this exists is to entice and encourage small, new farms to seek organic certification. Because of the income bracket under which Rick and Marilyn fall, they received a hefty rebate from the

state of Maine, and in turn are only required to pay \$200 per year for their certification as organic.

Labor costs

Currently, labor costs are not tracked, but instead are estimated. Rick and Marilyn are aware that they really should be monitoring and tracking the amount of time spent per day tending their animals and crops. In order to foster such data keeping, Rick and Marilyn would need to keep a small notebook with them at all times. As they both progressed from job to job, they could make a small note of what they were doing and the time at which they started and ended that work. They are hoping within the next few seasons that they can implement such changes to allow for better data tracking and record-keeping on their farm.

By tracking the amount of time spent each day doing various tasks, a better understanding of the labor involved on the farm can be made. The part of labor that Rick and Marilyn track closely has to do with the chicken processing part of their business.

Feed costs for laying chickens

The laying chickens are fed chick starter mash for 20 weeks. This is a high protein blend and is purchased in 50 pound bags. This feed costs \$.62 per pound. After the laying chickens have grown enough and are older than 20 weeks, they progress to a layer pellet which is also high protein. The layer pellet cost \$.53 per pound and is also purchased in 50 pound bags. The layer chickens go through roughly one bag of feed, 50 pounds of feed every two weeks. Some weeks, the birds go through 50 pounds of feed every week resulting in 100 pounds total per

two weeks. On average, this means that biweekly the chickens are consuming between 50 to 100 pounds of feed over 17 birds.

The younger flock feed varies per week and is roughly 100 pounds per two weeks for 26 birds. Since these birds are younger, smaller, and growing more rapidly, their feed and supplement needs vary and as a result they consume more at times than the adult birds.

Rick and Marilyn purchase feed for their laying chickens as needed every two weeks and feed is bought per bag as needed, not in bulk or by the ton. The supplier delivers once every two weeks and his prices per pound include the cost of shipping.

The useful life of layer chickens

In terms of productivity, Rick and Marilyn do not keep their layers for more than two years. The birds will produce well during their first year and after that, production will taper off and decline. The birds are hatched in the spring and begin laying eggs in the fall. Birds will typically lay well for their first year of production.

After two years, the birds are processed into stew birds. This year however, Rick and Marilyn are looking to sell their laying chickens after the two-year period to backyard farmers. The egg production of the birds during this time will be enough to sustain a backyard farmer and make raising the chickens worthwhile.

Purchasing costs of layer chickens

The baby chicks are sent via United States Postal Service and cost \$3.50 per chick. Like many other products, a quantity discount can be achieved; however Rick and Marilyn are purchasing so few that their cost per animal is higher.

Processing costs

Processing adult chickens, the layers, are more work since the meat is older and tougher. When Rick and Marilyn sell stew birds, they sell the animals by the pound rather than as whole animals. It takes three people two hours to process 50 birds. It costs roughly \$72 per batch for labor. Packaging costs include payment of two people for four hours of work. This equates to roughly \$48 per packaging of the 50 birds of the slaughter. In order to process laying chickens, the costs associated with processing are roughly 10 to 15 times more expensive per bird. As explained above, the meat is tougher because the birds are older, which complicates processing and adds additional labor.

Layer production

The laying chickens produce roughly 280 eggs per year per bird. The productivity of the laying chickens depends on a multitude of factors including the breed of the chicken and the light provided to the chicken. Rick and Marilyn keep track of egg sales but they do not keep track of egg collection per day. They keep an eye on the chickens and make sure that they are producing properly, but they don't write down any data, simply look to ensure everything is going accordingly.

The logic and reasoning behind the choice of layers

Rick and Marilyn choose to raise White Leghorn chickens for eggs. This is the most productive breed of laying chickens. The new batch that Rick and Marilyn have chosen to raise is considered an old-fashioned breed and will later be a good backyard farm bird. This variety of chicken produces a brown egg and will remain nice and productive for many years to come. In addition to this variety, Barred Plymouth Rocks, Black Australorps, Buff Orpingtons, and Rhode Island Reds are kept within the flock.

Gender identification of the baby chickens

When a farm orders chicks from the hatchery, the hatchery gives the business three options: all girls, all boys, or as hatched. In order to get a specific gender, someone must sex the animals to identify their gender. Since this takes additional time and resources, an additional expense is passed along to the purchaser. In terms of egg production, all males are the cheapest, as hatched are also inexpensive, with all females being the most expensive batch cost.

By having the animals gendered before purchase, the likelihood of having unusable animals is diminished largely. In a traditional setting, the boy chicks are slaughtered upon sexing since they serve no purpose for egg production. When purchasing a batch as hatched, the likelihood of receiving a boy chicken is roughly 50%, resulting in the reduced cost.

The stew birds market

Rick and Marilyn choose to sell their stew birds by the pound, rather than as whole animals. Their stew birds cost the consumer two dollars per pound. Since

Rick and Marilyn are in a transitional phase between white leghorns and the backyard breed, some birds from the last batch will be turned into stew birds. If sales of birds as backyard breeds remains and become successful, Rick and Marilyn hope to sell all laying chickens that way. The stew birds are sold fresh, not frozen, and are usually sold with ease within days of processing. The only suitable use of stew birds is in making soups or stock.

Laying chickens space allocation

Rick and Marilyn explained that four square feet per bird is the general rule for happy, healthy birds. Their birds get much more space than this rule. Their space could actually hold up to 50 birds, but they choose to house only 26 within their given space.

Water costs

Water costs are not necessarily traced, because they have a well on-site and do not link such costs to the business. At present, there seems to be no need to trace water costs to each enterprise of the business.

Supplies necessary for raising the laying chickens

It is important that heat lamps, shavings, feeders, waters, bins, and roosts are available for raising the chickens. All of these pieces were existing infrastructure from the farm, and as a result the costs are not allocated per flock.

Started Pullet Project

Rick and Marilyn have two large chicken facility buildings that have two floors of space. The second floor of both buildings has remained unused because there is no outside access for the chickens. In order to be certified organic, the chickens

must have access to the outside, which would be impossible if housed on the second floor of these buildings. Looking to utilize this space, Rick and Marilyn proposed a new business model, started pullets.

A started pullet is a laying chicken that has been raised between 2 and 20 weeks and has not yet started egg production. At present, hatcheries sell baby chicks at one-day-old and farmers raise the animals from that point forward. There are no current channels through which to purchase partially grown chickens, which have not yet begun egg production.

Selling birds a few weeks into life seemed like a viable and desired business and would also utilize the vacant space within the two buildings. By raising started pullets during the winter months (when no outside access was necessary anyways or possible), the birds could be raised legally and sold on the market.

Rick and Marilyn decided to start this venture during the winter of 2010 and sold these birds between week two and week 20 of their lives. As the bird grew older, Rick and Marilyn were able to charge more for the bird, as a result of the costs per bird increasing as they grew older. Rick and Marilyn provided me with a cost breakdown of the project to explain the income derived and the costs associated with this business.

The labor cost associated with this project was way more than anticipated, and as a result only occurred once that year. After the completion of that project, Rick and Marilyn reevaluated the situation, given the data collected on the project, and realized that this was not a profitable business model or project for

them to continue moving forward. At present, Rick and Marilyn have no plans of retrying the started pullet project.

MOFGA certification

Many agencies across the United States can attest that a business is complying with all requirements to gain USDA organic certification. The USDA itself does not certify any business or organization. Instead, local or regional agencies do this job for the USDA. As a result, if an organization has gained certification from a local agent, that business or organization can market themselves as USDA organic and/or certified organic by that agency (such as MOFGA). The national organic program recognizes Maine Organic Farmers' and Growers' Association and permits them to act on behalf of the USDA.

As explained earlier, the costs associated with gaining organic certification are somewhat covered by the government. The upfront costs are absorbed by the farmer and then the state or organization of certification itself or both will assist in reimbursing the given farm. It cost Rick and Marilyn \$800 upfront per year for their organic certification. Thanks to the farm bill, \$600 is reimbursed to them, leaving a total cost of organic certification per year for this farm as \$200 annually.

Coppal House Farm

The second interview with Meghan of Coppal House Farm was on 2/7/14 at 8:30 AM, on site.

The Useful Life of a Laying Chicken

The useful life of a laying chicken varies from farm to farm. Usually, a farmer will keep a laying hen for however long they remain productive. After the chicken

has been fully utilized, the farmer has two options: the farmer can sell the chicken as is to another farm, who will then process that chicken into what is called a stew bird, or the farmer themselves may process that laying chicken into a stew bird.

It is important to understand the processing costs associated with turning a laying chicken into a stew bird. At present, this stew bird market is very lucrative for many farmers. As mentioned above, as long as processing costs can be covered through the resale of that processed bird, selling these birds as stew birds is a promising and profitable transaction.

The processing costs associated with transforming a laying bird into a stew bird are multifaceted. The costs associated with processing the birds involve transportation and processing. On average, the transportation and processing costs associated with stew birds, is five dollars. Upon resale, this stew birds can be sold for \$11 per bird at the farmers market. As can be seen by this simple example, a six dollar margin can be realized on the resale of these stew birds. In the past, once a laying chicken was no longer productive, the remaining bird was viewed as a waste product. Many times, the farmer and their family would slaughter these birds for their own personal use. Now however, there is a demand in the marketplace for these birds, and as a result, the farmers can make a profit on this once thought of waste product.

At present, this farm is leaning towards getting laying chickens that are bigger birds, even though this would compromise the egg production of the business. The reason behind this decision is that a bigger bird will produce the

yield once processed into a stew bird, while also being a productive laying chicken.

Since it appears that the pricing of eggs is remaining relatively stagnant, while chicken meat pricing has the ability to fluctuate, this only makes sense. It is important to note however that this is a very delicate balance between egg production and breast size. The stew bird market is so profitable that this is the choice currently being made.

The farm had to decide on the type of breed to grow for their layers. Their choices were very different, ranging from utility birds to regular birds, to genetically modified animals, to heritage breeds. For many varieties of utility bird, a farmer will generally harvest 285 eggs per year. For a regular bird, that is, an average production bird, you will generally get roughly 350 eggs per year. This farm was shooting for having a dual purpose bird. These dual-purpose birds were both good utility breeds which meant that they were good layers and able to produce many eggs per year, but are also very good for their stew bird market, meaning that they would be good in terms of meat production at the end of their useful life.

The breeds of their laying chickens

This farm chooses to raise leghorns and black sex links. The farm has realized that the leghorns can be rather cannibalistic and destructive. With laying chickens, it is important to give them plenty of space to allow them to develop healthy respiratory systems, but also allowing them to feel minimal levels of stress during their egg production.

Because the Leghorn breed was destructive, the farm has decided to slowly phase this breed out of their production. They will now be utilizing only black sex links within their flock.

The lifecycle of their laying chickens

The most recent cycle of laying chickens was started in November 2013. During this time 300 laying chicks were purchased for a cost of \$669. It is important that these baby chicks have the proper amount of feed, water, and support tools. The starter feed for these birds was \$462.82. The next stage of their growing occurs when they are put on grower feed, which cost \$282.59. The third stage of their growth process occurs when they are transitioned to a mix of the mix grain and bagged grain. The mixed grain on this farm is composed and composed of corn mix, canola meal, trace minerals, and lime.

The most interesting part of their mixed grain is in the fact that many of these products are actually byproduct of other processes on their farm. The canola meal which is found within the animal feed is a byproduct of their oil pressing business. On their farm, they process and press canola oil for retail sale. In the context of the canola oil enterprise, the canola meal is viewed as a byproduct and would otherwise be a waste product. Instead, however, it is turned into livestock feed.

Since the initial cost of the canola seeds was absorbed within their canola enterprise, the cost can now be spread evenly over any enterprise which utilizes the canola byproduct. The canola meal has residual oils which helps the chickens process the other components of their diet. Traditionally, oils are added to

supplement a chickens' diet. During my interview, the farmer mentioned that in the past, oil was sprinkled over the chicken feed. Now, instead, the canola meal can provide this essential oil to the chickens while also adding bulk to their diet.

As mentioned above, the steps of producing and growing the laying chickens are as follows: purchase the birds, begin them on starter feed, transition them to the grower feed, feed them mix grain and bagged grain, and eventually transition them to a mixed grain.

Feeding the layers

Since the lifecycle of the laying chickens involves multiple different types of feed, it is important to understand how much each type of feed costs the farm. The grower/layer pellet food is purchased in 3 ton increments and cost the farm \$1250 when purchased in April 2013. When purchasing feed in 3 ton increments in April, this batch will last until October of that year. The reason this feed is able to be spread over multiple months is because these chickens are free range. This means that these animals are able to naturally supplement their diet through foraging on grass and other proteins located on the property. These costs are not necessarily captured within the cost structure of feeding the laying chickens.

A big difference is noted during the winter months, when the animals are not able to naturally forage and free range outside. The second purchase of feed for this batch of layers was purchased in October 2013 and needed to be repurchased in December 2013.

As we can see, feed costs during the spring and summer months are able to be spread over multiple months, such as April to October, which is

approximately 7 months of feeding for a three time batch of feed. During the winter months, when foraging and free ranging is impossible, that same 3 ton feed delivery will instead only be spread over three months. When repurchasing in October 2013, 3 tons of feed cost of the farm \$1167. Since the farm chooses to buy in bulk quantity, they get a small quantity discount. Unfortunately, however, bulk grain does have its downsides.

Bagged grain normally has extra calcium, which is necessary for quality eggs. By opting for bulk grain, the farm has to instead supplement their laying chickens with additional calcium supplements. In order to fill this gap, the farm chooses to purchase 50 pound bags of oyster shells for \$15. In terms of supplementation of their laying chickens, the farm utilizes trace minerals and calcium supplements with the oyster shells.

It is important to note that simply providing these animals with empty oyster shells will not constitute and fulfill their nutritional needs. These oyster shells are ground into a fine powder which is then added evenly with in their feed. These additional trace minerals and calcium allow for the corrected density and hardness of the eggs. Without these supplements, the eggs produced by the birds may become brittle, resulting in increased breakage.

Square feet per bird

Understanding how much space to allocate to a bird is of the utmost importance. This farm provides for a half square feet per each of their laying chicks. One of the major concerns of raising chickens, whether for meat or for eggs, is figuring out the right amount of space to allow each bird. Bacterial infections,

cannibalism, and respiratory problems can occur if such calculations are not made properly. As a result, figuring out just how much space to allot each bird is very important.

According to the farmer, Harold Pieper noted that 4 ft.² per bird was optimal, with 3 ft.² per bird being somewhat uncomfortable. He also noted that it is a somewhat delicate balance, where challenging the birds make them produce more effectively, but it is also important to grant them the space they need to be comfortable. Spacing also becomes problematic during the fall and winter months, when heat lamps are utilized.

The heating apparatuses are only equipped to heat a certain number of birds of a certain size. Accordingly, if too many birds are kept in too small of the space with too few heat lamps, the quality of life, safety, and productivity of the flock may be compromised.

During the winter months, a heat lamp is kept on the chickens for 14 hours and is provided by a 60 W bulb. Whenever possible, a solar sensor collects sunlight from outside of the barn and is able to power this light bulb through solar power. Through utilizing this solar collector, utility costs can be reduced.

Labor associated with feeding the chickens

Each week, it is important that the chicken feed is ground up and mixed properly. With average labor on this farm being nine dollars per hour, and it takes roughly one hour per week to grind and mix the chicken feed, we can conclude that it cost the farm about nine dollars per week to make chicken food. To break down this

cost we can realize that the grinding of the chicken feed takes about 15 minutes, while the mixing of the chicken feed takes roughly 10 minutes.

The cost of feeding livestock – The broilers

- It takes about 10 minutes per day to take care of the broilers
- Labor is calculated as an average of \$9 / hour

The broiler birds are raised for 14 weeks and then sent for processing.

Each batch of broiler birds is purchased in 300 bird quantities, and the farm anticipates completing three batches of 300 birds per year. The slaughter schedule for their broilers occurs from February to July. This is an untraditional slaughter schedule for many farmers in the area.

This schedule was chosen systematically by this farm for many reasons. The farmers realized that so many different farmers were looking to process their chickens at almost always the same time that landing a spot within the facility was problematic. As a result, slaughterhouses were inundated with multiple requests during certain times of the year, with other parts of the year their facilities were running nearly dormant. These slaughterhouses of course would love to be busy all of the time. Unfortunately, many farmers are unwilling to attend delicate crops like baby chicks during the winter months. Because of the unforgiving nature of the New England winter, many farms look to start their broiler batches once the weather has gotten relatively stable.

Starting chickens in the dead of winter nearly almost always results in some fatalities. When done correctly, however, the chicks will survive; it just

requires tender care and monitoring. This is exactly what Coppal House Farm has decided to do.

Coppal House Farm chooses to start their broiler batches when no other farmers are doing so. This results in the 14 week cycle ending when no other farmers are looking to process their animals. This allows them to get more available slots, and more competitive pricing. The slaughterhouses simply want to keep busy, and as a result will offer competitive pricing during the off-season. Very few farmers have caught on to this system, and as a result Coppal House is able to seize this opportunity.

The life of the broilers

In order to survive, whether it is the spring, the summer, or the winter, the baby chicks must be kept warm for the first six weeks of their lives. A traditional brooder will heat 100 birds. Since Coppal House orders their birds in 300 bird batches, one would think that they would require three brooders.

What Coppal House has realized is that instead they are able to utilize two brooders with minimal fatalities. One of the complications of utilizing brooders within the winter is the risk of fire. Placement of the brooder can put many other assets at risk. If all 300 chicks and their two brooders are placed within a facility that houses many other animal enterprises, a fire would be incredibly problematic.

While fire is always a risk and always problematic, the occurrence of such a disaster can be exacerbated depending on where it occurs. As a result, baby chicks are traditionally placed separate from other animal enterprises, in the off chance that a brooder catches fire, so loss is minimal. While any loss is

undesirable, realizing the reality of such a business is important. In order to decrease fire risk, Coppal house has realized that instead of increasing the likelihood of fire with the additional brooder, they can continue to utilize two brooders for their 300 birds with little repercussion.

When choosing the breed of bird to utilize for their broiler business, Coppal House decided to go with red and white Cornish hens. These birds grow at a good rate and are effective and efficient meat producers. In order to source these birds, Coppal House Farm purchases their chicks from Hoffman Hatchery, located in Pennsylvania. This hatchery is an Amish farm and has traditional practices. These Cornish hens grow slower, which allows for their limbs to grow properly.

A major problem in traditional chicken practices is the presence of leg deformities. Some of the genetically modified breeds of chicken are well known for their inability to walk and move properly. Since the quality of life of these birds is of concern to this farm, they wanted to strike a balance between good meat producers, and birds that could free range properly. Not only does free range allow the birds to supplement their diet, but their quality of life, including the health of the bird, is better. When the chicks arrive at Coppal House Farm, they are one day old and arrive via the United States Postal Service.

The broilers are allotted 2 ½ to 3 ½ ft.² each. The same set up is utilized for both the broiler chicks and the layer chicks: a brooder and light is provided.

Feeding and processing the broilers

During the 14 week lifecycle of their broiler chickens, these animals are given to different types of feed: starter feed and broiler feed. The cost of the starter feed

and the broiler feed is approximately \$1021.34. The feed is purchased in 50 pound bags. The last batch of broilers purchased was in September 2013 and used to feed 200 birds. The cost of these 200 birds was \$243. In order to process these animals, it cost the farm \$800. The processing costs were distributed between their broilers and the layers. \$700 of the processing costs was tied into the broiler processing, which took care of 200 birds. The remaining \$100 was to slaughter the laying chickens that were due to become stew birds during that processing cycle.

Processing costs include many different areas: labeling, killing, processing, packaging, and transportation. It costs roughly 5 dollars per bird to process. For an additional \$82, Coppal House has decided to label and market their products for additional cost. This \$82 for labeling occurs at the processing plant, where the processing agents apply custom marketed labels, which are more specific and visually appealing than the generic labels provided at the slaughterhouse. The farmers have decided that this additional cost is worthwhile and helps differentiate their product. During the lifecycle of these birds, which is 14 weeks, no supplements are provided toward the chickens, and they are allowed to free range whenever possible.

Because of different governmental regulations, Coppal House Farm is limited to processing 1000 birds per year. At present, this is not problematic. In the future though, when they anticipate on increasing production, they may need to investigate other processing options. The Milford slaughterhouse is the only

USDA chicken facility in New Hampshire. Through this slaughterhouse, Coppal House Farm is currently processing all of their chicken products.

Pricing of the broilers

Rather than selling their broilers for parts, Coppal House Farm chooses to sell their animals whole. This minimizes processing costs, as well as simplifies production. Broilers are sold for \$4.49 per pound. Eventually, the farm anticipates that they will increase processing by selling parts and pieces, in addition to value added products.

Budgets

While the farm does not keep any formalized budgets, they are looking to increase some of their budgets. They are looking to increase the amount of funds which they allocate to advertising. Areas of their business which are making more money, they feel are worthwhile to invest in further. The successful parts of their business will be gaining more funds throughout the next few years and will have an increased focus on them. Their CSA program sales are up, where they sell mostly meat and eggs. Their bookkeeper mentioned that because their CSA a sales as well as their farmers' market sales has been increasing, they will likely spend more money on the segments of their business.

Since the sales of their community supported agriculture program are up there considering new investments for this enterprise. One of the new investments they would like to purchase would be a freezer dedicated to the meats for this program. A new freezer suited to this type of business would cost roughly \$700. The question now becomes should they purchased this new freezer and allow this

segment of the business to continue to grow. Evaluating the pros and cons of this investment are needed before the purchase can be completed.

One area that the farmers have expressed interest in focusing on, is their company logo. At present, the farm logo is a pastel pumpkin. Since the farm is known for so many different products, services, attractions, events, it only makes sense that their logo captures all of the different enterprises that their business features. Unfortunately, the farm realizes that creating a new logo will not only be costly, but time-consuming as well. As a result, the farm is evaluating options for revitalizing their logo and marketing.

Sales distribution

At present, Coppal House Farm sell their products at the farmers market, on-site, and through a community supported agriculture program. For our purposes, we will consider on-site and community supported agriculture one revenue stream. As a result, the sales distribution between these channels is as follows: farmers market sales contribute to about two thirds of their income, on-site and community supported agriculture contributes one third of their income. This is especially the case during the winter months when people are motivated to go grocery shopping at the farmers market. During other parts of the year, there are other opportunities for Coppal House Farm to gain sales on-site as a result of different events occurring on their farm such as the corn maze or sleigh rides.

Inventories

When the farm calculates inventories, they do so by counting how many packages of meat are within freezers and are sent to the farmers markets. Rather than

tracing their meat inventories per pound, they track their meat inventories by packaging. This simplifies the process, and allows for more frequent inventory tracking. The way that they create a system to calculate inventory starts with tracing how many packages are here, how many packages were sold, and for how much money. They also use a first in, first out system. Since they deal with perishable items that have a designated shelf life, it only makes sense that they would use this type of technique.

Their bookkeeper completes a monthly inventory analysis. On occasion, however, she completes inventory more than once per month. One area which complicates their analysis is their self service farm stand. The reason that this can give them trouble is that the records of their self-service business rely on honesty and proper record-keeping. They rely on their customers reporting exactly what it is that they purchased while shopping at their farm stand, and depositing the correct amount of money within the till so that sales match up with how much money was collected. Inventory for the self-serve farm stand can become tricky, but in the past the business has not seen many issues with this enterprise

One area that the farmers noted was the importance of realizing and understanding market fluctuations. Market fluctuations take a big toll on small farms and businesses. As a result, it is of the utmost importance to know what is occurring and figuring out ways to change and modify the business to cope with these changes.

Corn production

Out of all of the corn that this farm produces, the corn maze attraction helps to supply one third of the corn it necessary for feeding the animals. Since the corn maze is viewed as a separate enterprise of the business, the cost of producing this corn for this attraction, are able to be spread evenly over all enterprises which utilize this byproduct. As could be expected, when the farm is analyzing all of the costs associated with this corn maze, both the seeds to produce the corn and the labor associated with the maintenance, creation, and staffing of the maze are important.

When the corn maze is done for the season, the leftover corn might otherwise be viewed as waste. Rather than selling the corn to the general public, the farm is able to utilize this “byproduct” in a more productive way. One third of all the corn used to feed the animals on this farm comes from the corn maize corn. In terms of staffing this production, the farm pays people in corn. Individuals helping with the cleanup from the corn maze provide their labor and in exchange receive corn to take home.

In order to understand the corn production of this farm, we must now understand how much it cost the farm to plant this corn. Corn is sold in bags by seed count rather than by pound. Last year, it cost the farm \$2725 or 10 bags of corn seed. Each bag of corn seed contained 80,000 seeds. Each bag costs the farm \$272.50. As explained above, one third of the corn cost listed above is tied up in the corn maze. However, two thirds of the cost goes to feeding the animals on the farm.

Water costs

Water costs are spread evenly over many enterprises of the farm. During the summer months, the farm is very lucky. There is a naturally occurring brook that runs right through the farm property, which allows for natural watering of their animals. Over the winter months and during other parts of the year, the farm does have to supply water to their animals. According to the farm however, these costs are very minimal and as a result are not calculated as a line item of expense

Price lists- the layers

In terms of selling the eggs, the farm chooses to sell in dozens. This farm does not sell eggs by the half-dozen. One dozen eggs costs the farm labor, which is broken down into collection, cleaning, packaging, and labeling. As described above, the average hourly rate for an employee of this farm is nine dollars an hour. In terms of labor, it takes about 20 minutes per day to tend the layers. It takes about one hour per day for egg collection, 30 minutes for cleaning and packaging, which equals 1 ½ total hours for eggs. This time includes collecting, washing, and packaging. During the winter months, eggs are sold by the dozen for five dollars. During the summer time, when the market is inundated with many egg producers, eggs are sold for \$4.50 per dozen.

The pig enterprise

Coppal House Farm keeps 25 pigs per year. Pigs are purchased in November and sent for processing in April. Again, choosing to process in the off-season is a major cost and stress consideration. In addition to the multiple benefits of processing in the off-season, doing so for their pig enterprise is additionally

beneficial. Because pigs have no sweat glands, keeping these animals cool during the warmer months is problematic. It is easier to keep pigs cool in the winter and fall months, which adds to their comfort level. The pigs are able to gain more weight when they are comfortable, which increases efficiency.

The current slaughterhouse facility which they are utilizing has very limited abilities. This facility is only able to process about 15 animals per weekend. Since so many farmers are trying to utilize this facility, it gets very busy very quickly. This also adds to the benefits of off-season processing. In slaughterhouse facilities, you cannot kill more than one type of animal per day. This also complicates scheduling of farm processing.

The pigs on their farm may be sold as whole animals, or as parts, or sausage. Whenever a pig is sold on the farm as a whole animal, it is sold roughly at cost with very little margin being made. This farm sells their pig products as follows: chops, ground pork, loin roasts, shoulder, butt, sausage, baby back ribs, spareribs, country style ribs, pork tenderloin, and bacon. One area of their pricing strategy which they are unsure of is their pricing for their rib meat. In order to increase sales, they have decided to sell rib meat for the same price, regardless of style or preparation technique. They are unsure as to whether or not they should be selling their rib cuts for different amounts.

Supplies to keep the pigs

In order to have a pig business, it is important that certain materials are purchased. A pig feeder, a pig waterer, a heater, and a proper housing unit are necessary. A

traditional pig feeder costs upwards of \$200, which is the cost of the apparatus utilized at this farm.

At Coppal House Farm, the housing unit used for the pigs is able to be easily assembled and disassembled depending on the needs of the farm. On average, it takes five hours to assemble and or disassemble the housing unit for the pigs. Because labor costs the farm roughly 9 dollars per hour we can say that it costs \$45 every time you assemble a pig house and \$45 any time you disassemble a pig house.

Choosing a pig breed

While the farm bookkeeper was unable to provide specific breed choices, she was aware of the logic behind the farmer's choice. One of the favorite cuts of meat for a pig centers on the bacon. As a result, pigs that can produce large quantities of bacon are preferable. Any type of pig breed that is long and has the right composition of fat and muscle will be able to produce more bacon. At present, Coppal House Farm produces traditional bacon. Since bacon is such a popular item on their menu, the farm is looking to expand its bacon product line into also including shoulder bacon and Canadian bacon.

Feeding the pigs

The pigs on the farm go through multiple different feed stages. The animals begin with starter feed, then progress to pig and sow, then go to a mixed feed which is composed of corn, soybean meal, and swine premix. The last stage of their feeding is very important, and as a result the farmers are looking to perfect this feed. A proposed change to the feeding schedule would result in the final stages

of feeding including corn, sunflower meal, and swine premix. The reason for this switch would be because soybean meal is much more expensive. While sunflower meal is less protein, it is composed of more fats. While this would alter the composition of the pigs' diet, the farmers have seen that the pigs still do very well and gain weight appropriately. Since the determining factor here is one mostly of cost, making the switch only seems logical.

Since both the canola and sunflower meal are produced on-site, the nutritional makeup of these products would otherwise be unknown. When feed is bought on the open market the nutrient contents are well marked and understood. Thankfully however, science has allowed for the type of analysis needed to make the right decision.

Both the canola and sunflower meals of Coppal House Farm were analyzed using wet chemistry. This analysis allowed the farm to understand the chemical makeup of the product which they produce. This also allowed for the farm to make the right decision regarding the nutrient composition of these products. They were then able to compare directly the products which they produce at their facility compared to competitors producing similar products. Not only were they able to make an educated decision regarding the choice between soybean meal and sunflower meal from their facility, but they were also able to directly compare these same products to the open market. In the end, they decided to use their own produced sunflower meal to supplement the pigs in their feed composition.

Many farmers utilize trash compost to feed their pigs. What this means is that any time a person has food scraps that were otherwise un-edible, the pigs were able to supplement their diet with these products. For this farm however, trash compost is not an option for emotional reasons. If the people would no longer eat it, why would you want your animals consuming these products? As a result, veggie compost is utilized.

Pricing of their pig products

The pricing of these products is based on the value of the cut and other prices within the marketplace. Coppal House looks at other local farms, and compares their prices to their competitors. In general, their prices tend to be lower than other competitors for certain cuts of meat. This again raises the question as to whether or not ribs should be priced differently depending on style. In addition, the farm looks at what these cuts of meat are going for in the grocery store setting.

Another influencing factor in their pricing strategy has to do with processing costs. Over the last few years, processing costs have increased. However, their prices have remained relatively the same. Instead of passing along these costs to the consumer, they have decided to eat these costs, in the hopes of remaining competitive. They are fully aware that not only their business is affected by these increased processing costs. As a result, until many other players within the marketplace start increasing prices as processing costs rise, the farm does not feel it is in their best interests to elevate prices in the saturated market.

Flying Goat Farm

The second interview was canceled as a result of illness. Cara was quite ill for a few days and was unable to reschedule. As a result, the second interview was unable to occur and the initial interview will be the focus of the farm analysis.

Kelly Orchards

Our second interview occurred on 2/14/14 at 9 AM, at Arthur Kelly's personal residence.

Arthur Kelly purchased Kelly Orchards in 1982. At the time of purchase, favorable depreciation rules existed. As a result of this, the business owns all depreciable assets, while Arthur Kelly owns the raw land. The trees, buildings, and equipment belonged to Kelly Orchards Incorporated. As noted on the financial statements provided by Arthur Kelly, there is a line item called lease expense. When asked, Arthur explained that a better explanation of this expense is rental expense associated with the land. Each year, Arthur will evaluate whether or not to secure an operating loan to cover the expense of the land and any additional costs associated with getting the business started out for that season. Advertising expense includes the costs associated with creating and maintaining their website.

Ricker, Carter Hill, and New Hampshire Cider Works all sell Arthur's apples. Apples are sold in 15 bushel bins. Ricker sells Arthur's apples at Hannaford supermarkets in 3 pound bags or as loose apples.

Apples are turned into cider depending on fruit quality. Many times, apples are turned into cider because they lacked color or because there is some

sort of injury on the Apple. Many different varieties make suitable cider. There are certain varieties that are commonly used for cider.

When Arthur makes a cider, he sends his apples to Guile Orchards. The cost of producing the cider includes pressing and packaging of the apples and cider. A tote of apples is a half peck.

Expenses associated with selling apples to wholesale accounts such as a Ricker, include packaging, tote containers, count boxes, 12/3 boxes, multi use boxes, delivery charges, and bin trucking charges. Wholesale revenues totaled \$53,000 last year. This revenue was attributable to Snell farm, Riverside farm, York Corner Gardens, Guile Orchards, Sweetser farm. Arthur chooses to deliver to all of his wholesale accounts.

Arthur chooses to not have any of his fruits graded. Grading of fruit is more costly and sometimes the result will be unfavorable to the farmer. Even though fruit that is graded is able to be sold for more, Arthur chooses to sell his fruits as is for less money, which he feels is more beneficial to his business. He might have more cider apples than originally anticipated, which would deteriorate his bottom line. If this was the case, those apples that were deemed cider apples would be priced differently and would have cost Arthur money to grade. Instead, Arthur chooses to sell his fruit and price them as he sees fit.

Boxes for transport cost Arthur different prices depending on the size of the box. A half box, which is used to transport peaches, costs \$4.50. A full box costs \$5.50. While the initial cost of purchasing these boxes might be hefty, these boxes are able to be reused by Arthur.

Arthur sells his apples for roughly \$.50 per pound when selling to a wholesale account. Arthur sells his peaches for roughly \$1.25 per pound when selling to a wholesale account. The retail channels through which Arthur sells his fruit are the farmers market and pick your own located on-site at Kelly Orchards.

Pick your own is conducted for the apples at Kelly Orchards. Arthur charges \$.85 per pound for apples picked in this fashion. For many other pick your own establishments, apples are charged at roughly \$1 per pound. Arthur chooses to charge less for his apples at pick your own for a multitude of reasons. Many other pick your own establishments have scenic views, petting zoos, and other attractions. These are the type of attractions that Arthur and Kelly Orchards do not have. For families looking for a quality apple and a fun day on a farm, Arthur is able to provide. As a result, in order to remain competitive with other pick-your-own establishments which may foster additional attractions, Arthur charges less per pound for his apples. Arthur tries to see things from the customer's point of view and prices product accordingly.

Arthur expressed within our interview the importance of direct marketing to the consumer, along with proximity and closeness to the consumer. This is why Arthur chooses to work at all farmers markets and handle all wholesale account deliveries himself.

There is a price differential is substantial between selling to Ricker or selling to North Berwick farmers market. Arthur sells to Ricker at \$.30 per pound, while he sells apples for \$1.99 per pound when selling in North Berwick farmers market. As we can see by this example, selling in retail settings versus wholesale

settings is heavily beneficial to Arthur's bottom line. As a result, Arthur hopes to phase out wholesale accounts and focused specifically on retail outlets.

Arthur is trying to determine what the least efficient market is through which he sells his fruit. Arthur always wants to figure out what is desired within the market and then find ways through which to satisfy that want within his product line. In terms of pricing, Arthur noted that the market determines your pricing strategy. You simply need to just figure out what works. In general, Arthur refers to Hannaford's pricing when determining an appropriate price for his products.

As mentioned above, Arthur is looking to decrease wholesale channels and increase retail channels. In order to increase retail channels, Arthur must increase advertising and marketing efforts. He knows that in order to make this happen he must pull more consumers into participating in his farmers markets and pick your own events.

Kelly Orchards is considered a sub S corporation and lists all expenses on a per acre basis.

Within the next few years, Arthur would like to update and invest in a new spraying system, and irrigation system, and a new tractor. Arthur currently sells blueberries, peaches, and apples to Snell farm. Arthur's sells boxed apples to your corner garden. In terms of water costs, no irrigation system is used at Kelly Orchards. The water is naturally retained within the soil and the trees are watered whenever it rains.

Cost of Growing Trees- Apples

Art chooses to buy his apple trees already started, at about three years old. The roots of the apple trees are about three years old, while the top of the trees are roughly one year old. The greenhouse will buy the tree in August, and then Arthur will plant those same trees the following spring. Because Arthur plants trees of various kinds, the price per tree varies. On average, Arthur pays nine dollars per tree. The nine dollars per tree does not include shipping. Trees are shipped in boxes, and you are charged per box shipped by the company.

In terms of understanding the cost of growing his trees, Arthur simply looks at the cost of the tree, rather than also allocating the shipping costs there. A separate line item is allocated to understanding the cost of shipping and transportation of his trees. Because Arthur purchases in bulk, he receives a discounted price when purchasing apple trees. The price of your apple tree depends on the quantity in which you are purchasing. There are certain ranges of trees, such as 1 to 50 trees, 51 to 100 trees, etc. Depending on the number of trees purchased, Arthur can receive a bigger quantity discount. Pest Management includes insect traps, consulting costs, and the cost of pesticides. Nutrition costs include all costs associated with feeding the trees and fertilizers.

Picker expense includes the reimbursement of travel expenses. Picker expenses must be paid 15 days after hire or when half of the contract has been fulfilled, whichever comes first. Also included in picker expense is the cost of the cable television located within the farmhouse. Because Arthur has fruit pickers coming in from Jamaica, the picker expense is particularly important. Another

important aspect of picker expense to know is that the wage of the picker from overseas or outside of the United States is not determined by Kelly Orchards. Instead, the wage of foreign pickers is determined by the United States government. This can result in paying a picker \$9.50 per hour in one season, and then paying that same picker \$8 an hour the following season. Arthur has no control over the governmental choices regarding these foreign workers. As long as he continues to employ these workers, he is forced to comply with the standards set in place by the government of the United States.

The spacing of Arthur's trees has changed from season to season. At first, each apple tree was given 12' x 20'. Then, each tree was given 5' x 15'. At present, each apple tree is given a space of 4 x 12'. In order to increase labor efficiency, Arthur and his crew are going to try 3 x 8' spacing this coming season. The equation for determining tree spacing is row width times 0.9, which will give you tree height. It is important that the trees are given the opportunity to capture as much sunlight as possible.

Because Arthur currently has over 30 varieties of apples within his orchard, it is important to monitor which varieties are selling best and which varieties should be phased out. Arthur completes an analysis similar to that each season to figure out which varieties to grow, and which varieties to discontinue. In order to have this happen, Arthur discontinues one variety each season and plants a new variety each season. Arthur is always trying to evolve as a business and supply the consumer with products that they want.

There are so many different factors that can affect the useful life of an apple tree. Factors such as whether, drought, freezing, and others can shorten the life of the tree. As a result, it is hard to estimate how long a tree within Kelly Orchards will be useful. According the literature on the subject, a typical apple tree will remain fruitful for roughly 20 years.

Arthur tries to target production and estimate how many bushels per acre per year he can produce. The target for apples last year was 1,000 bushels per acre per year. Last year, Arthur grew 1,210 trees per acre for apples. The trees themselves cost \$9000. The trellising system for the apples cost \$6,000. It took two people two days to plant all the trees. This equates to 30 hours at \$13 an hour. It took two weeks to install the trellising system. This means that it took 160 hours to install the trellising system at a rate of \$13 per hour. As you can see, planting and installing the trellising system is a costly endeavor.

One of the questions that Arthur wanted me to research was why apples seem to do well in times of recession. He also wanted me to get a better understanding of the cyclical nature of the market for apples. He was also interested in looking into the supply and demand of different apple crops.

Cost of Growing Trees- Peaches

Arthur plants 65 trees per row, and allocates the space of 8' x 17' for each peach tree. When the arithmetic is complete, this means that there are 320 trees per acre in Arthur's peach patch. Arthur says that on average, eight peach trees cost eight dollars per tree. He purchases his apple trees, peach trees, plum trees, and all other seeds from the same distributor. As noted above, trees are priced per tree, with

additional shipping charges added at the end. As with the apple trees, art tracks cost per tree and then traces shipping costs as a separate line item. The price of your peach tree depends on the quantity in which you are purchasing. There are certain ranges of trees, such as 1 to 50 trees, 51 to 100 trees, etc. Depending on the number of trees purchased, Arthur can receive a bigger quantity discount.

Arthur sells his peaches in quarter peck bags for \$2.50 per pound. These bags sell for \$10. Arthur noted that it is so important to be good at selling your product. Once you master this skill, other aspects of your business become slightly less important.

Arthur tries to anticipate and budget for how many bushels per acre per year he can grow for each enterprise of his business. The target for his peaches was 500 bushels an acre per year. Last year, it costs are \$3000 for trees for an acre of peaches.

Cost of Growing Trees- Plums

Arthur does not focus on growing plums, but instead noticed the popularity of this fruit within the marketplace. As a result, Arthur grows minimal plum trees, but just enough to sustain and supply the demand within this market. Arthur is currently growing one row of plum trees, with 50 trees in each row, each tree getting 10 feet per tree.

Last season, plum trees cost Arthur \$14.50 per tree. As noted by this price, plum trees cost Arthur much more than his peach or apple trees. When purchasing plum trees, Arthur does not receive a quantity discount. As a result, peach trees and apple trees are less expensive for Arthur to grow. If Arthur was to choose to

grow more plum trees, more likely than not he would be able to purchase plum trees for a competitive rate, similar to that of an apple or peach tree. As of right now, Arthur does not anticipate growing more than one row of plum trees per season. He will continue to evaluate the profitability of this product line and from there, determined whether or not more or less plum trees should be grown.

In order to grow plums properly, you must first pick them and then set them to the side to ripen. You never let them ripen on the tree. The more plums Arthur grows the more he will sell. This simply makes sense.

Depreciation

Arthur provided me with copies of his depreciation schedule from his federal return of last year. On this return, it is noted that his apple trees, peach trees, plum trees, and all other trees were able to be depreciated. Arthur is also currently depreciating his trellising system, a mower, and two vehicles. On the tax forms, \$12,836 was listed for depreciation of trees, Moeller, and trellising system. Also noted on the tax forms, were \$1398 of depreciation for the two vehicles listed on the forms.

Budgets

Arthur currently completes month-to-month budgets. Certain parts of his budget he computes through using historical data. Payroll and electricity expenses can be projected for the next year using this year's figures. Arthur uses last year's actual figures in order to estimate an effective budget for the next year. Arthur is currently evaluating the 2013 data for all of the different expenses and revenues with in his analysis in order to determine his 2014 budget figures. Rather than

simply using last year's actual as projections for this year, Arthur uses last year's figures in addition to additional analysis in order to compute this year's budget.

Cost allocation

Of all of the crops Arthur tends, peaches are the most costly. This is because they are more time and labor-intensive. Hand thinning of the peaches takes 25 hours to complete, spread between multiple workers. Normally, hand thinning of the peaches takes 10 days to complete, and can be estimated using a \$12 per hour average labor salary. Arthur works closely with his younger high school staff during this process to ensure that it is being done properly. Arthur hires young high school students in addition to workers from around the country and from other countries. Because of the peach harvest being so specific, Arthur must monitor his workers closely

Pricing

Arthur has a different pricing strategy depending on the location of the sale. Arthur has retail and wholesale accounts through which he sells his fruit. At the farmers market, it would cost to consumer \$1.49 per pound or six dollars for a half pack of his apples. Certain varieties of his apples are more expensive, such as the honey crisp. The honey crisp apples cost the consumer \$1.99 per pound.

In terms of value added products with his apples, it costs the consumer \$5.50 for a gallon of Arthur's cider, or \$3.25 for a gallon of this cider. It costs the consumer \$1.49 per pound for Arthur's pears. In order to purchase plums, it costs the consumer three dollars for a pint. Peaches cost three dollars per pound or \$10

for a 4 pound bag. Blueberries cost \$4 a pint or seven dollars a quart. Pick your own apples cost the consumer \$.85 per pound.

Pick your own is only done for Arthur's apple crop. The peaches and plums are too valuable to elect such a pricing or picking strategy. Arthur does not feel that having pick your own peaches or pick your own plums would be profitable enough to deal with the waste and loss associated.

Customer Profitability Analysis

Arthur has multiple wholesale accounts through which he sells his products. Arthur completes deliveries on Tuesdays and Fridays. Snell farm, Anderson farm, and Sweetser farm all purchase from Arthur on a wholesale basis. In order to attend to these three accounts, Arthur spends roughly 6 hours per week and 3 hours per delivery day tending to these accounts. Arthur has made sure that his delivery loop is efficient and will travel to Snell farm first, loops over Anderson farm, and then waits for Sweetser farm to pick up at Anderson. The 6 hours per week of maintenance of customer accounts covers maintaining accounts through delivery, traveling to Anderson, and returning home. Arthur has worked hard to ensure that the delivery loop is efficient and saves time. Arthur ensures that he maintains a professional and friendly relationship with his wholesale accounts and realizes that the price he charges these accounts are crucial.

Sometimes Arthur wonders if he is spending too much time being friendly with his wholesale accounts. Some weeks, Arthur will spend a long time conversing with the owners of Snell Farm and when he gets home realizes he may have stayed too long to chat. On the flipside, Arthur knows that having a social

and friendly relationship with these accounts is crucial to the maintaining his product on the shelves. In this sense, the amount of time spent maintaining these accounts are worth it, as long as the price is right.

Spoilage, Rework, and Scrap

Making the decision to graft your trees rather than throwing them out has to do with multiple factors. You are able to get back into production sooner if you graft your trees, rather than replanting. In order to graft a tree successfully, you first select the variety of tree you would like to plant. Next, you cut the branches from the selected type of tree, and stick those branches into a bucket with sawdust and water to reduce drying. It is important that these branches remain refrigerated until the grafting occurs.

Arthur says that he is able to graft 70 trees per day and when figuring out the labor cost associated with graphing a tree, he said that 6 hours will usually be spent grafting trees at a rate of \$15 per hour. When the arithmetic is complete, we can see that it costs \$90 roughly to graft 70 trees. A farmer must look at the size and spacing to determine whether or not a graft is worthwhile for a tree.

When comparing and contrasting the purchase cost of a new tree versus the grafting cost of a tree, it becomes obvious very quickly that if a successful graft is achieved, that this is a very cost-effective choice. Material costs are minimal when grafting a tree; the labor is the most important factor to know. There are certain materials that are necessary in order to graft a tree. The most important is the cleft grafting tool. This tool splits the log, helps make the whole for the graft, and lessens the strain of finishing the job.

Arthur noted that in order to assess the costs associated with grafting, simply know how much time and effort will be necessary in order to graft the type of tree and the number of trees you are looking to work on.

Riverslea Farm

The second interview with Liz and Jeff was unable to occur as a result of increasingly busy schedules on their part. The information given in the first interview was heavily focused on Jeremiah, and will therefore lead to centralizing our analysis of this farm on Jeremiah's operations.

The second interview with Jeremiah took place on 2/8/14 at 10 AM, at the Riverslea Farm house. During our interview, we discussed many topics including cost of feeding livestock, budgets, inventories, depreciation, and cost allocation.

Initially, I was hoping to look at Riverslea from two angles: from the goat / sheep side (with Liz and Jeff), and from the chicken operation (Jeremiah). Both animal groups would be analyzed in terms of cost to raise and pricing strategies. The value added products of the farm would be explored, such as the Sheppard's Pie Liz and Jeff prepare, and the sausages that Jeremiah produces. Unfortunately, the analysis became single when the schedules of Liz and Jeff became too busy to participate further.

Explaining the cost of feeding the broilers

Jeremiah purchases his baby chicks in batches of 500. He typically does 2 batches per season. It cost him roughly \$1.99 for each baby chick. Since he is purchasing his animals in batches of 500, twice per year, this equals a cost of roughly \$1700 per season. Since he is buying in bulk, he receives a quantity discount from the

hatchery. He received his delivery of chicks roughly every five weeks. He will start raising his broilers in early April. The last batch of broilers would be in early August.

The useful life of his animals is eight weeks. Since his last batch of animals would come in early August, this would allow all processing to be complete by the beginning of October. This is extremely important to his operation because avoiding the cold temperatures helps mitigate risk. Raising baby animals, especially chickens, during cold periods of the year can increase mortality rates and can be extremely stressful. By timing his operation around these times of year, he can avoid these problems.

When purchasing the baby animals, Jeremiah has the option to provide the animals with supplements and or inoculations. Both of these services, which are provided by the hatchery, come at an additional cost. Both of these services are not utilized by Jeremiah.

Feeding the broilers

His chicks follow a specific progression in their feed. He starts his animals on a 19% protein starter mash, which he purchases in one ton increments. The animals then graduate to a 19% protein chick starter crumble, which is also purchased in one ton increments. The last stage of their feed schedule is composed of a 16% protein pellet, which is also purchased by the ton. Because of the minimum purchase agreements from his bulk supplier, Jeremiah chooses to buy one time of starter mash, 1 ton of chick starter, and 2 tons of protein pellets each time he makes a feed purchase. 1 ton of feed is composed of 40 bags of feed, each

weighing 50 pounds each. Each level of feed costs roughly \$950 per ton. While there is a small difference between the different levels of food in terms of cost, the difference is minimal, so an average cost is used. Adult birds grow differently when they are inside rather than when they are housed outside.

Each group of 40 birds consumes 25 pounds of feed per day. Since Jeremiah raises his birds in batches of 1000, this means that 625 pounds of feed are consumed on this farm per day once they are fully grown. During the first two phases of feeding: the starter mash and the starter crumble, the birds are allowed to eat as much as they please. Once the birds are put onto protein pellets, however, Jeremiah rations their feed to prevent them from developing abnormalities and from eating themselves to death. Chickens are known to continue to eat regardless of hunger if food is presented in front of them. As a result, it is neither cost-effective nor safe for Jeremiah to allow his full-grown chickens to eat as they please. He provides necessary levels of food in order for them to grow properly and in a safe fashion.

Square feet per bird

During the first three weeks of life, each baby is allotted one square foot. After three weeks of life, each bird is then allotted two square feet. Jeremiah makes sure that there is enough space to allow for proper growth of the animals. He chooses to keep all roosters and no hens. While roosters are known for their aggressive nature, Jeremiah processes the animals before this can become problematic. By allowing the animals proper space there is less likelihood of bacterial infection and respiratory problems.

Processing of his animals

Processing of his chickens cost \$8,000 to process 1,000 birds. Processing costs include transportation, fuel costs, rental of crates, packaging, labeling, and containers. Processing costs are not typically broken down by food type, but instead are generalized. Breaking down processing costs for different types of products such as sausages and/or parts would have been very complicated and timely. As a result, Jeremiah has decided to treat processing costs as a common cost of all of his different whole animals, processed parts, and value added items.

At present, Jeremiah sells whole birds, processed parts, sausages, and value added prepared meals. In the future, he would like to produce ground chicken for eight dollars a pound, boneless chicken breasts for \$13 a pound, and expand to produce chicken patties for nine dollars a pound. The chicken patties he is looking to produce would be flavored and spiced but would not be breaded like the kind you find in the grocery store. In addition to these new future product lines, he would also like to expand his existing sausage line, which is currently priced at \$10 per pound.

Value added products

Jeremiah currently sells stocks, broths, and soups. All of these products are produced in a commercial kitchen by an independent contractor. It is important that these products are produced in a way which allows Jeremiah to sell them in a retail setting. If these products were not made in the correct fashion, Jeremiah would be unable to sell them at the farmers market or other retail channels.

Because Jeremiah is utilizing an independent contractor to produce these products, it is important to note the labor involved in this production. Stock costs about \$80 to produce a batch. A batch of stock is 45 quarts. It requires 30 pounds of chicken bone in order to produce a batch of chicken stock of this size. The \$80 covers all parts of the process, which includes containers and labeling.

Choice of chicken breed

Jeremiah chose to purchase the jumbo Cornish crosses for his flock. These are a generic white bird that is double-breasted. When choosing the breed of bird, it is important to note that some varieties have larger breasts but might come with downsides. Jeremiah knew that while the type of bird he was choosing was not the largest breast bird, it was important to consider the quality of life of the animal.

Animals that have larger breasts typically have mobility problems and compromised quality of life. His birds are a somewhat middle-ground. This is because they are able to produce large quantities of meat, while at the same time still able to move freely and without impediment. Jeremiah made sure to note that these are not heritage breed birds. Many people at the farmers market are looking for heritage breed birds, which are known for lean and small breasts. Jeremiah wanted a bird that would be robust and produce quite a bit of meat, but at the same time, be a breed he could feel good about choosing.

Water costs

Since this farm is multipurpose, some costs that would otherwise need to be considered, other segments of the operation absorb. Liz and Jeff, the chief

operators of this farm, cover any water costs created by Jeremiah. Also, it is important to note that the cost of watering his animals is minimal and not considered a necessary line item.

Pricing list

Jeremiah sells his birds in many different ways. Jeremiah sells sausage for \$10 a pound, he sells whole birds for five dollars a pound, bone-in breasts for \$12 per pound, thighs for \$11 a pound, legs are \$10 a pound, wings are nine dollars a pound, stock is \$3.50 for a quart, stew birds are \$12 apiece, soup is sold for \$4 for an 8 ounce container prepared hot, soup is sold for eight dollars for frozen pint, organs are sold for four dollars a pound, feet are sold for \$1 a pound. Jeremiah sells the following organs: heart, liver, neck.

Stew birds

Even though Jeremiah does not have laying chickens on his farm, he sells processed stew birds as part of his product line. Jeremiah purchases live layers from a local farmer and then processes the animals at the slaughterhouse with his broilers. Stew birds cost two dollars to purchase, five dollars to kill, and two dollars for other processing. This means that the total expense involved in acquiring and processing these animals is nine dollars. Jeremiah is able to sell stew birds for \$12 at the farmers' market or on-site at their farm store. Because the lambs and goats of Riverslea farm are processed as USDA animals, it was extremely important to Jeremiah that his chicken line was also USDA.

Dealing with waste

At present, Jeremiah is not purchasing bulk feed for a silo. Instead, he is purchasing bulk feed that is bagged. As a result, his animals are generating multiple bags per day of waste that would otherwise have no purpose. In order to reuse and repurpose the feed bags, Jeremiah, along with Liz and Jeff, use the feed bags as waste receptacles and trash bags. Occasionally, the bags will be recycled, but for the most part, they find alternative purposes around the farm.

Utilities

Any of the utilities which are required for his broilers are listed as a separate line item in his expenses. Utilities were about \$12 per day which equates to \$500 total to cover the 1000 birds per season. As we can see, each bird costs about \$.50 in utilities over its useful life, which may include heat lamps or brooders. No water heaters are necessary in Jeremiah's operation because he chooses to raise his animals during the warmer parts of the year.

Depreciation

Jeremiah currently does not hold any depreciating assets. It is also important to note that no tractor is necessary for the chickens. While the farm as a whole has many depreciating assets, none of them are directly linked to the chicken operation.

Budgets

Jeremiah tries his best to budget throughout the season and understand any variances between projected and actual numbers. During the season, processing costs were much higher than budgeted. The costs of his brooders were

underestimated, as were his watering costs. It is important to note that the cost of watering his animals includes the water pump, hoses, watering tanks, in addition to other supplies, not the cost of the water itself. There were many other costs that were not originally anticipated which affected Jeremiah's bottom line.

Inventory

Jeremiah does not keep any inventories. Whenever he travels to the farmers market, he simply tracks how much money he makes. Rather than creating a spreadsheet for how much he is bringing to market and checking things out as he sells them, he relies on his sales figures to explain inventory levels. As mentioned during our interview, he will look into the freezer and see areas which are depleting, and choose to focus on replenishing those areas. Any time numbers are tracked, it is by the pound, rather than per package., because package weights vary greatly.

Sales Distribution

Jeremiah currently sells its products through two different channels: the farmers' market and on-site sales, with 75% of his sales occur at the farmer's markets, with 25% of his sales occurring on-site at their farm store.

Meadow's Mirth

The second interview with Josh took place on 3/28/14 at 10 AM, at White Heron Tea Company in Portsmouth. Josh grows many different crops. As a result, I will be focusing on his pricing, budgets, and restaurant accounts. He has experienced a fall-off in sales, so our goal was to investigate pricing decisions, to see if this could be to blame.

Depreciation

Josh invested in a 1995 used tractor 2 years ago. The tractor cost \$18,000 and Josh estimates he will be able to use the asset for 15 years. When he purchased the tractor, he also purchased various other accompanying tools for the tractor. These accessories for the tractor have various useful lives and help make the tractor more helpful on the farm. In addition to the “new” tractor, Josh has many other tractors and pieces of equipment. He is using accelerated depreciation methods for his assets.

Budgets

Josh uses crop enterprise budgets to project production for each of his crops. I have included an example of a crop enterprise budget for mesclun, which is one of his most profitable products. As noted on this budget, a multitude of line items are necessary in order to understand all expenses involved in growing this crop. Another aspect of this budget is that it ties in to the larger picture, which incorporates all crop enterprise budgets into one fluid stream. The actual numbers for this year are substantially below next year’s budgeted figures. This is for specific reasons. Josh has decided that he needs to cut back and really focus on producing less, but doing so in a more efficient manner.

Over the next few years, he hopes to increase production, while minimizing losses. At present, they are able to produce more, but the level of loss is also very high. The farm is trying to scale back, improve processes, and then slowly work its way back up, while also mitigating losses. Josh mentioned they have two options: produce a lot while losing a lot, or scale back and perfect their

process. While it is unfortunate that a step back is necessary, he hopes this will allow for substantial growth in the future.

Please refer to the crop enterprise budget for mesclun and the expanded budget for more information.

Spoilage, Rework, and Scrap

Josh keeps pigs and chickens on his farm. While my analysis does not center on these livestock, their manure becomes part of this conversation. The chicken manure is spread naturally around the farm using the chicken tractors. This is a type of rotational grazing and exposes the chickens to multiple pastures. Each rotation exposes the fields to new manure as well. The chicken tractors are used on fallow plots, which helps enrich this resting soil.

The pigs are not supposed to be on these fields. At times, however, the pigs get loose and wander on to the fields. Any manure that is spread this way is unintentional and unwanted. The pigs assist on the farm by keeping the tree line back and by taking care of food waste. Waste produce that is unable to be sold at market and is undesired by the farm crew is fed to the pigs. These food scraps are only supplements to the pigs, but helps to ensure no food on the farm goes to waste.

Some of the plastic products used on the farm are unable to be recycled and as a result, end up in the landfill. At present, no recycling centers in the area can process these plastics properly. Waste water is not an issue on the farm at present.

Pricing

Josh uses the MOFGA price report to see if his prices are in-line with other organic growers. Since Josh has been in this industry for over 10 years, he also relies on his industry knowledge and understanding to set his prices. He has been trying to increase his prices gradually over the last few years. Unfortunately, many of his customers have noticed and responded with distaste. Josh's costs are going up while his prices are staying relatively the same.

He has tried to reduce "sticker shock" by playing around with his packaging techniques. Sometimes he will price per box, other times by the pound, and sometimes price per unit (each). Depending on the product, his pricing strategy may differ. Something like hot peppers will be price per unit (each) to help cover the fact that they are \$25 per pound. So far, consumers have been responding better to this system. One interesting comment Josh made regarding his pricing was that "if less than 10% of people are complaining about your prices, you aren't charging enough."

Customer Profitability Analysis

Josh explained the importance of his presence at the markets. He is the brand and must be there to represent what he does. At many of these markets, Josh will be there to converse with his customers, while a money handler will be there to finalize the sale. He would love to have multiple hands at market to handle all sales, while Josh could be there to talk about what he does and educate the consumer.

In terms of wholesaling, the distribution network is changing. Josh explained the importance of enriching the relationship he has with his accounts. As a result, he hopes to visit all wholesale accounts once every two weeks. He must establish and nourish the relationship between the customer and himself. At present, Josh is the only staff member in charge of managing these accounts.

Bison Project

Our second interview with Conor took place on 3/26/14 at 2 PM, at White Heron Tea Company in Portsmouth. Conor is a part-time farmer running a small bison operation. During the interview, we focused on the cost of raising his animals, the prices he charges for the processed animals, and any budgets he keeps.

Conor's animals are both born and purchased, depending on which herd member being analyzed. He started his herd by purchasing 13 animals, a mixed variety including bulls and cows. The cost of these animals vary, but totaled \$10,000-\$15,000 including the animals, trucking fees, state tariffs, corral, fencing, and other expenses. Because breeding occurs naturally on the farm, no additional expenses are incurred on this front.

Useful Life of the Bison

Bison are kept for different lengths of time depending on their purpose on the farm. Typically, animals are processed after 2 summers, which means the animals are roughly 2 ½ years old. If they were at max capacity, seven animals could be processed each year. At present levels, however, between 3 and 5 animals are processed per year. As mentioned above, slaughter occurs at different ages, depending on the needs of the farm. If the animals would be considered desirable

for breeding, he / she would be kept longer than the standard 2 ½ years. Conor also analyzes the market. There is sometimes a demand for bison steak, which would require younger animals. Other times, bison chuck is desirable. In this case, older animals fit the bill. Lastly, breeding animals might be necessary. In this case, animals would be kept longer to satisfy this need.

Space Allocation

Given the space the farm has available, Conor and his business partner could raise a max of 25-30 bison on the property. The bison which they raise, Plains Bison, need 1 square acre to thrive. Since Conor's property is roughly 30 acres, more land would be necessary if expansion was further desired.

Bison feed

Conor feeds his animals round and square bales of hay during the winter months. The square bales are relatively easy to move, while the round bales require additional teamwork between the partners. Because of this, it takes roughly 1 hour per day to feed the animals. On the weekends, this may take longer, but other tasks are completed in addition to feeding on the weekend.

In terms of supplementation, this is very limited and consists of a calcium / trace mineral block (costing roughly \$10 per season), de-worming agents, and de-pesticide agents. During the summer months, the animals naturally graze on the fields. Conor rotates the herd to help ensure the soil quality. This is called rotational grazing.

Water costs

Conor uses a pump house which contains the pump which is connected to his well. This pump house is connected to a solar panel which negates some cost. This solar panel was purchased using a grant. As a result, Conor does not trace water costs.

Budgets

Conor tracks income and expenses. Other than these metrics, he does not track or project for the future. In terms of labor, only he and his business partner are employed by the project. At this point, budgeting seems unnecessary in his eyes.

Spoilage, Rework, and Scrap

In terms of waste products, the only waste Conor could think of was the bison manure. This is spread naturally through the rotational grazing. In addition, Conor and his business partner spread the manure manually 2-3 times per season. Each time the manure is spread, it takes roughly 3 hours per pasture, with 5 pastures being on the property.

Pricing

Conor uses hanging weight to determine the price of his bison shares. He charges \$7.50 / lb of hanging weight for the shares. On average, his animals will weigh 500 lbs and customers will purchase quarter or eighth shares. His retail pricing strategy is listed on his website and on the Project's Facebook page. At present, his supply hasn't been able to keep up with the demand in the marketplace. As a result, pricing of his products has not been problematic at this point. Conor is able

to charge more because the demand is there. When selling in wholesale channels, Conor discounts his prices roughly 10-15% off.

In the future, Conor would like to expand his product line to include bison fiber, skulls, bones, and hides. With such value-added products, more time and money would be necessary. Conor would also need to determine if such products could be produced in a profitable manor.

Inventories

After processing, Conor's product returns in USDA organic frozen packages. He tracks cuts purchased and revenues generated. When going to the farmers' markets, he packs the coolers and then tracks sales as the market goes on. He finds that he is constantly trying to keep up with the demand for his products. He finds there is no urgency to sell his products because the demand is so high. If one customer doesn't buy, the next will.

Customer Profitability Analysis

Conor sells roughly 85% of his product through the farmers' market. The remaining sales are generated locally (~5%) near the farm and through wholesale (~10-15%). Choosing the right farmers' markets to take part in is difficult, but comes down to best use of time. At present, Portsmouth in the summer and Seacoast Eat Local markets year round are their choices. Other markets are occasionally used to sell product, but this is more for community enrichment rather than for profit. Conor expressed that the Portsmouth and Seacoast Eat Local markets are the two markets in the community where your time is really worth the money.

4.0 Analysis of Data Collected Through Interviews

Interviews began in mid-December and concluded in late February. Throughout the time I was interviewing farmers, analysis was conducted. With each interview came new understanding of both subject matter and interview technique. By the end of the process, I knew the direction necessary to complete a thorough and interesting analysis.

4.1 Identification of Common Denominators

During my farm selection, one of my objectives was to choose farms that differed, in the hope that this would complement nicely with the similarities revealed through the interview process. As explained in the methods section listed previously, varying product lines was the objective. Chicken farms, goat farms, a dairy farm, bison operation, and many more were showcased and the result was different than the initial expectation. While I was hoping for more similarities to arise, a wonderful direct comparison became apparent through analysis of Coppal House Farm, Chick Farm, and Riverslea Farm.

While all three farms operate on very different scales, the main similarity they share is their chicken operations. Coppal House Farm raises chickens, in addition to many other livestock. For Jeremiah, chickens are his sole business. In the case of Chick Farm, chickens happen to be the focus, but other product lines supplement income. Because of the varying scales of the operations and place chickens fall within each individual business model, a nice comparison evolved.

4.2 Understanding Differences and Similarities

Central Product Line(s)

As mentioned above, because of the varying size of each operation, each farm runs at a different capacity. At present, Jeremiah's full business surrounds his broiler chickens. Eventually, he is looking to expand into vegetables, but is working on perfecting the chicken segment of his business in the interim.

Rick and Marilyn's central focus is on their broilers and layers. In addition to these chicken varieties, they grow fruits and vegetables during the summer months. Eventually they would like to increase the scale of their chicken operation, but that would take time and additional capital. For the time being, chickens will remain their focus.

Coppal House Farm is heavily diversified. While chickens (both layers and broilers) provide a steady source of income for the farm, the other value-added products contribute heavily as well. The focus of the farm varies by the season. Accordingly, I would not say that chickens are the central focus of Coppal House Farm. Because of the additional product lines, Coppal House has become a four-season farm.

Startup Costs – Purchasing Baby Chicks

The farms purchase baby chickens in various quantities depending on their product needs for the season. All three farms purchase broiler chickens, so this analysis will center on this enterprise analysis. By comparing and contrasting the three farms, given one central product line, a more complete understanding can be gained.

Baby chickens can be purchased from various hatcheries located throughout the Seacoast. Because of the high costs associated with shipping live animals and gender identification, choosing the correct hatchery is very important. Finding a hatchery located close to the farm, while also finding one which supplies quality animals is crucial. The closer the hatcheries, the lower the shipping costs and lower the stress on the baby animals. Ensuring strict quality standards is also important. This helps ensure that the animals are healthy and properly gendered.

Chick Farm

Rick and Marilyn have been utilizing the same hatchery for many seasons and have been satisfied with the results. Rick and Marilyn purchase their broiler chickens from a hatchery that includes shipping costs within per unit cost. **It cost \$1.58 per chicken** and Rick and Marilyn purchase 50 chicks per week during the first few months, transition to 80 chicks per week during the summer months, then transition back to 50 chicks per week for the last month of the season. When purchasing in batches of 50, each order costs the farm \$79. Each 80 chick batch costs the farm \$126.49.

A typical farmers' market season runs for 26 weeks. Since Rick and Marilyn are looking to cater specifically to this sales channel, a 26 week cycle was used. For my analysis, I considered the first two weeks of the season being 50-chick cycles, with the last four weeks also being 50-chick cycles. This results in 20 weeks being 80-chick cycles and 6 weeks being 50-chick cycles. Roughly

1,900 birds are raised each season. **Accordingly, total chick purchasing costs equal roughly \$3,002 per season for the broiler chickens.**

As can be expected quantity discounts occur at certain levels of purchase. Quantity discounts for this hatchery occur for purchases of 50 chickens to 99 chickens and for purchases of 100 chickens and upwards. At present, Rick and Marilyn only qualify for the **first-tier of quantity discount** at this hatchery. In order to gain a more substantial quantity discount, Rick and Marilyn would be forced to purchase their baby chickens in batches of greater than 100 per week.

Riverslea Farm

Since Jeremiah has only been operating for one season, an established relationship with his hatchery is in the works. Within the next few seasons, he will have a better understanding of his needs and make changes as necessary. It will also be necessary for him to analyze his costs to ensure he is making the best choice financially.

Jeremiah purchases his baby chicks in batches of 500. He typically does 2 batches per season, resulting in roughly **1000 birds** being raised each season. It cost him roughly \$1.99 for each baby chick. Since he is purchasing his animals in batches of 500, twice per year, **this equals a cost of roughly \$1700 per season.** As the arithmetic shows, total costs would be approximately \$1,990 per season. Since he is buying in bulk, he receives a quantity discount from the hatchery. Given the data available, we can assume Jeremiah is receiving a **quantity discount of \$145 per batch**, totaling savings of \$290 per season, through quantity

discounts. Each unit of chicken effectively costs \$0.29 less, bringing per unit costs down to **\$1.70 per chicken**.

Coppal House Farm

As do the other farms, Coppal House bases their needs on the market schedule and anticipated sales at the farm stand on-site. All data collected at Coppal House was based on the most recent findings. With the chickens, we looked at the most up-to-date data collected for the season.

The last batch of broilers purchased was in September 2013 and was composed of 200 birds. The cost of these 200 birds was \$243. When divided, this results in **per unit cost of \$1.22**. Since we did not evaluate the whole season, per unit cost will be used as a comparison point. Also, quantity discounts, if any, were not a topic of discussion, nor were they mentioned when the cost breakdown was analyzed during the interviews.

Analysis of Chick Purchasing Costs

Per unit costs for each farm, batch size, years in operation, and total chickens grown vary significantly from farm to farm. Per unit costs range from \$1.22 (Coppal House Farm), to \$1.58 (Chick Farm), to \$1.70 (Jeremiah) and may vary for a multitude of reasons. As mentioned above, batch size varies significantly. When analyzed using this metric as the determining factor, one would expect Jeremiah's price to be lowest, with Rick and Marilyn's price being highest. As we see, however, this is not the case. Accordingly, some other factor must come in to play. Years in operation may have something to do with this discrepancy.

Coppal House Farm has been serving the Seacoast for years, was established in 2006, and is well known for their varying product lines. Because of established relationships, additional discounts may apply. Chick Farm has been operating a chicken business since 2001 (under the operation of Rick and Marilyn). Lastly, Jeremiah established his business last year. Because of this analysis, it is apparent that years established alone mustn't be the determining factor.

Another important aspect to understand is the implications of state of incorporation. Both Coppal House and Jeremiah operate in New Hampshire. Chick Farm is located in Maine. While I do not think that location has a large impact on pricing, it may. As a result, further research would be necessary to conclude properly.

In the end, explaining differences in per unit pricing most likely is a result of batch size and years in operation. Neither of these measurements is able to function on its own, and when combined, explain the differences observed. Largest batch size is utilized by Jeremiah, who is also newest to the business. Second largest and third largest belong to Coppal House and Chick Farm respectively, which explains their placement in the comparison.

Feeding the Chickens

Because the farms operate under different standards (conventional vs. organic), the proceeding analysis may be heavily influenced by these factors. Coppal House Farm uses conventional practices, Chick Farm is certified organic, and as such,

feeds organically, and Jeremiah feeds organically but does not have certification, at present.

Chick Farm

The broiler chickens are raised for seven weeks until they are processed. During their lifetime, they are fed a **chick starter mash** which costs **\$.48 per pound** and is purchased by the ton in **3 ton minimum** quantities. No other feeds are used during this time. The feed arrives by truckload and is blasted into their barn. As a result, each truckload of feed costs the farm roughly \$2,880. Because not all feed was utilized by the birds, the full costs should not be allocated to the broiler chickens. For the purposes of this analysis, though, we can say that **feed cost per season for the broilers is \$2,880.**

If we go back to the prior analysis, where 50 chick batches are completed for 6 weeks and 80 chick batches are completed for 20 weeks, total chicks grown would be 1900. **When spreading feed cost over chicks grown, this would result in average feed cost being \$1.51 per chick.**

Riverslea Farm

Jeremiah's chickens follow a specific progression in their feed. He starts his animals on a 19% protein starter mash. The animals then graduate to a 19% protein chick starter crumble. The last stage of their feed schedule is composed of a 16% protein pellet. Because of the minimum purchase agreements for his bulk supplier, Jeremiah chooses to buy 1 ton of starter mash, 1 ton of chick starter, and 2 tons of protein pellets each time he makes a feed purchase. 1 ton of feed is composed of 40 bags of feed, each weighing 50 pounds each. Each level of feed

costs roughly \$950 per ton. **This results in feed cost being an average of \$0.48 per pound.** While there is a small difference between the different levels of food in terms of cost, the difference is minimal, so Jeremiah utilizes an average cost.

Each group of 40 birds consumes 25 pounds of feed per day. This means that each chicken is consuming, on average, about 0.635 lbs of food per day. **The industry average is 0.3 lbs per day for a fully grown bird.** Since Jeremiah raises his birds in batches of 500, this means that 312.5 pounds of feed are consumed on this farm per day, once the birds are fully grown. Considering the birds are kept for 8 weeks, this means that over the course of 8 weeks, 56 days have passed. In total, 17,500 lbs of feed are consumed per batch of chickens. In tons, this is roughly 8.75 tons of feed. Because of the composition of the feed purchase, one batch would require two feed purchases. **Since each ton of food costs roughly \$950, total feed cost per batch is \$8,312.50.** Since this number is based off of 500 chicks, that makes **average feed cost \$16.63 per chicken.**

Coppal House Farm

During the 14 week lifecycle of their broiler chickens, these animals are given two different types of feed: starter feed and broiler feed. The cost of the starter feed and the broiler feed is approximately \$1021.34. This means that each feed level costs approximately \$510.67. The feed is purchased and 50 pound bags, and bought in bulk. Total feed costs are spread over the 200-chick batch, **resulting in feed costs of \$5.10 per chicken.**

Analysis of Feed Costs

The cost associated with feeding the broiler chickens was much more diverse from farm to farm than I would have otherwise expected. The lowest total costs per chicken were exhibited by Chick Farm, while highest feed cost per chicken was seen in Jeremiah's business. Because of the level of experience, years in operation, and rationing practices of the farm, these results seem logical.

Strangely, organic vs. conventional buying practices did not seem to influence per chick costs. Both Chick Farm and Jeremiah had the same per pound cost for their feed. Considering both Jeremiah and Chick Farm grow using organic practices, this was logical.

Jeremiah mentioned in our interviews that feed rationing was not done properly in seasons past. As a result, the stark contrast between Chick Farm and Riverslea Farm makes sense. The numbers exhibited in terms of feed allotment was more than twice the national average. Accordingly, Jeremiah's feed costs were substantially higher than the other farms being reviewed.

Water Costs

Chick Farm

Water costs are not necessarily traced because they have a well on-site and do not link such costs to the business. At present, there seems to be no need to trace water costs to each enterprise of the business. Rick and Marilyn have no desire to trace such costs on their farm.

Riverslea

Since this farm is multipurpose, some costs that would otherwise need to be considered, other segments of the operation absorb. Liz and Jeff, the chief operators of this farm, cover any water costs created by Jeremiah. Also, it is important to note that the cost of watering his animals is minimal and not considered a necessary line item.

Coppal House

Water costs are spread evenly over many enterprises of the farm. During the summer months a brook that runs through the farm property allows for natural watering of their animals. Over the winter months and during other parts of the year, the farm does have to supply water to their animals. According to the farm however, these costs are very minimal and as a result are not calculated as a line item of expense.

Analysis of Water Costs

None of the farms consider water a necessary line item, and as a result, have not traced the costs to their enterprises. When asked, all farms unanimously said that they had no interest in tracing such costs and did not anticipate doing so in the near future.

Certifications

While Jeremiah is hoping to achieve organic certification in the near future, Chick Farm was the only chicken operation within my analysis which held an organic certification.

Labor Costs

Chick Farm

Rick spends roughly 2 hours per day tending the broiler chickens, while Marilyn spends roughly 4 hours per day tending the broiler chickens. Rick handles the majority of the outside chicken labor, while Marilyn handles the inside chicken labor. Marilyn handles the chickens during the first three weeks of their lives, which are completed inside. After the chicks have grown for three weeks, they are transitioned outside and Rick manages the associated tasks. The hours worked each week are estimated, rather than recorded. Both Rick and Marilyn are aware that more thorough timesheets should be kept. Since they are the only two workers during non-processing times, they have continued to “get by” with few records regarding hours worked.

Riverslea Farm

Jeremiah did not describe the labor tracking used by Liz and Jeff. As explained in the prior sections, Jeremiah pays his rental agreement through labor on the farm. The exact details were not divulged, but any time over the designated obligation is compensated in cash. Many times, work is done as needed, and on occasion, compensation other than rent fulfillment is achieved.

Coppal House Farm

Each week, it is important that the chicken feed is ground up and mixed properly. Average labor on this farm is nine dollars per hour, and it takes roughly one hour per week to grind and mix the chicken feed. From this, we can conclude that it costs the farm about nine dollars per week to make chicken food. To break down

this cost we can realize that the grinding of the chicken feed takes about 15 minutes, while the mixing of the chicken feed takes roughly 10 minutes. In total, roughly one hour is spent tending the broiler chickens, costing the farm \$9.

Analysis of Labor Costs

The labor of each farm differs greatly. Chick Farm runs normal operations with no employees. As a result, sometimes data is not recorded as necessary. With Jeremiah, his obligations lie in fulfilling his rental agreement. Finally, Coppal House keeps detailed records in terms of labor. This is because of their heavy reliance on employees. Coppal House hires many UNH students and brings in part-time labor each season. Accordingly, proper records are necessary for a multitude of reasons.

The Useful Life of Chickens / Choice of Breed

Chick Farm

Rick and Marilyn keep their broiler chickens for seven weeks until they are processed. They have chosen to raise Cornish Cross Rock birds, which are recognized as a standard meat bird. This variety of bird grows so fast that joint problems occur and are apparent by the time the birds are seven weeks old.

Along with the joint and muscle problems suffered by these birds, breathing becomes problematic as a result of the heart working to support their ever-growing bodies. Because these birds are still babies, their skeletons are extremely fragile which lends to additional complications. These birds are growing at such a fast rate that their skeletal structures cannot support the weight.

The bones themselves are trying to grow and support the body with the body itself also growing exponentially.

Because the farm allows for free foraging, the animals are able to experience the outside and move around freely in the outdoors. By allowing the birds to go outside, they can use their legs, which help alleviate some of the problems of this breed. By processing at seven weeks, many of the problems experienced by these varieties are minimal and do not greatly affect the bird's quality of life. If Rick and Marilyn were to grow their birds further, the pain endured by the birds would be severe and bird fatalities would increase due to heart failure and the like.

Riverslea Farm

The useful life of Jeremiah's animals is eight weeks. Jeremiah chose to purchase the jumbo Cornish Crosses for his flock. These are a generic white bird that is double-breasted and is standard for many broiler operations. Jeremiah knew that while the type of bird he was choosing was not the largest breast bird, it was important to consider the quality of life of the animal. Animals that have larger breasts typically have mobility problems and compromised quality of life. His birds are a somewhat middle-ground. This is because they are able to produce large quantities of meat, while at the same time still able to move freely and without impediment. By processing at eight weeks, health complications are minimal and quality of life has not been heavily affected.

Coppal House Farm

The broiler birds are raised for 14 weeks and then sent for processing. When choosing the breed of bird to utilize for their broiler business, Coppal House decided to go with red and white Cornish hens. These birds grow at a good rate and are effective and efficient meat producers. While they do not produce the largest breasts, they live longer with minimal health complications.

Analysis of useful life / breed choices

Both Chick Farm and Jeremiah grow chickens which are known for large breasts, rapid growth, and health problems. By processing early on, the chickens are subjected to minimal complications and the end product is one of the most efficient. Coppal House, on the other hand, opted for slow-growing birds and emphasizes quality of life over efficiency. As compared to Chick Farm, Coppal House grows chickens for twice as long. Because of the variety chosen, Coppal House can extend the lifespan of the birds without inflicting pain or suffering. The birds at Coppal House can grow comfortably during their 14-week cycle.

As exhibited by all three farms, efficiency and quality of life are in a delicate balance when choosing a breed of chicken to grow. Faster growing birds are far more efficient, but also entail compromised quality of life. Many farmers choose to strike a balance between the two. Unfortunately, one of the factors is almost always compromised when making the decisions: quality of life or efficiency?

Processing Costs

Chick Farm

Chick Farm has a processing facility on-site and completes all tasks by utilizing friends and family for help. Their niece and a family friend help on processing weeks. It takes three people two hours to process 50 birds. It costs roughly \$72 per batch for labor. Packaging costs include payment of two people for four hours of work. This equates to roughly \$48 per packaging of the 50 birds of the slaughter. The total processing costs per batch of 50 birds equals \$120. When converted into per unit analysis, it costs roughly **\$2.40 per bird for processing and packaging.**

Riverslea Farm

Jeremiah outsources processing and utilizes a local processing plant to take care of the animals. It costs Jeremiah roughly \$8000 to process a batch of 1000 chickens. On a per unit basis, **this results in \$8 of processing costs per chicken.** Processing costs include transportation, fuel costs, crate rental, packaging, labeling, and containers.

Coppal House Farm

Coppal House Farm outsources processing and utilizes a local processing facility. Last season when they sent their broilers to processing, 200 birds were processed at a cost of \$700. On a per unit basis, this means that it costs Coppal House Farm **\$3.50 per bird to process.**

Analysis of Processing Costs

The farms analyzed either outsource their processing or complete the tasks in-house. Chick Farm had the lowest per-unit processing costs (\$2.40) per bird and completed processing on-site. Coppal House has the second lowest costs (\$3.50) per bird and outsourced processing. Lastly, Jeremiah had the highest processing costs (\$8) and outsourced processing.

As might be expected, Chick Farm has the lowest processing costs because they are completing the tasks on-site and are very efficient in their methods. A “make or buy” decision was made on their end and they have been able to mitigate costs through effective decision making.

Space Allocation

Chick Farm

Rick and Marilyn allow 4 square feet per bird while indoors and 2 square feet per bird when they are outside under the chicken tractor. The reason why there is a space reduction when the birds are going outside is because the chicken tractor moves daily and allows for clean space and new foraging capabilities. Because of the new ground and space available to the chickens each day, the reduced square footage can be rationalized. The chickens are quite comfortable according to the couple.

Riverslea Farm

Jeremiah has very limited space, given his rental agreement. Accordingly, the birds are allotted minimal space. During the first three weeks of life, each chick is allotted one square foot. After three weeks of life, each bird is then allotted two

square feet. Jeremiah makes sure that there is enough space to allow for proper growth of each animal. He chooses to keep all roosters and no hens. While roosters are known for their aggressive nature, Jeremiah processes the animals before this can become problematic.

Coppal House Farm

Coppal House utilizes the practices of Harold Pieper, who noted that 4 ft.² per bird was optimal space allocation, with 3 ft.² per bird being somewhat uncomfortable. It is a somewhat delicate balance where challenging the bird makes them produce / grow more effectively, but it is also important to grant them the space they need to be comfortable.

Spacing also becomes problematic during the fall and winter months when heat lamps are utilized. The heating apparatuses are only equipped to heat a certain number of birds of a certain size. Accordingly, if too many birds are kept in too small of the space with too few heat lamps, the quality of life, safety, and productivity of the flock may be compromised.

During the winter months, a heat lamp is kept on the chickens for 14 hours and is provided by a 60 W bulb. Whenever possible, a solar sensor collects sunlight from outside of the barn and is able to power this light bulb through solar power. Through utilizing this solar collector, utility costs can be reduced.

Analysis of Space Allocation

Both Chick Farm and Coppal House allot their birds four square feet of space while inside. Jeremiah, on the other hand, allows much less space per bird. Given the constraints of his system, the choice makes sense. Unfortunately, the space

allotment is so much smaller it makes one consider if more space is necessary. As mentioned in earlier analysis, Jeremiah's business model may need adjustment if bird quality of life is to be emphasized.

Supplementation

Chick Farm

Nutribalance mineral supplement was used to help with the flippers. A flipper chicken is one which dies suddenly and flipped onto its back. Rick and Marilyn were unsure as to what was causing the chicken mortalities nearing the end of their lives. At first, they were utilizing a mineral supplement to help alleviate and fix this problem. After utilizing the supplement, however, they realized that Flipper chickens were still occurring. After conducting extensive research within the community and resources online, Rick and Marilyn realized that this condition was caused by the chicks being too cold during the first few weeks of their lives.

By monitoring the brooder temperatures, they have mitigated losses and drastically decreased the number of chicken fatalities due to flipping. By monitoring the heat of the brooders during the first few weeks of the chickens' lives, the chickens have a better chance of surviving through the cold and surviving through the remainder of their lives on the farm.

The "flipping" is caused by an Acidis condition which presents itself later on in the chickens' lives. If the area and which a chicken lives is too hot, ammonia becomes problematic and the chickens lungs become compromised. If the area in which the chickens live is too cold, the flipping condition can present

itself later on in the chickens' lives. This condition occurs when the chicken is little, but shows itself when they grow bigger.

Riverslea Farm

When purchasing the baby animals, Jeremiah has the option to provide the animals with supplements and or inoculations. Both of these services, which are provided by the hatchery, come at an additional cost. Both of these services are not utilized by Jeremiah.

Coppal House Farm

During the 14 week lifecycle of their chickens, no supplements are given to the chickens. The birds are allowed to free-range as desired, but no other products are added to their diets.

Analysis of supplementation

Unlike with layer chickens (where supplementation is quite common), broiler chickens are rarely supplemented. This is for many reasons. Mainly, broiler chickens have a limited useful life, resulting in minimal inputs being allocated. Also, any supplements given would have little effects on needed areas (such as quality of life). The rapid growth of many varieties of chicken is imminent, and accordingly, processing schedules are altered, rather than additional costs being incurred to help mitigate this reality. The rapid growth is desired. If this was not the case, other (less troublesome breeds) would have been chosen.

As is exhibited here, supplementation is more of an anomaly than common practice when dealing with broiler chickens.

5.0 Suggestions for Improvement and Change

5.1 Identification of Areas to Improve

Cost of Feeding Livestock

While many of the farms chosen have livestock, Chick Farm, Riverslea Farm, Coppal House Farm, and Bison Project are the businesses where this metric was analyzed thoroughly. As mentioned in section 4, Chick Farm, Riverslea Farm, and Coppal House have chicken operations which help foster a direct comparison. Accordingly, the specific costs are cited above in section 4.2. For Bison Project, his feeding costs were incredibly straight forward, leaving little to contest or suggest improvements for.

Going back to the analysis of section 4.2 lends itself to further reflection. Feed cost per chicken varied greatly. Chick Farm has lowered their feed costs to **\$1.51 per chick**. As a result of buying in bulk and purchasing loose grain, they have substantially lowered their costs. While the unutilized grain would otherwise be wasted, the couple has found new ways to utilize the leftovers. Because of this, their feeding structure seems sound and reasonable.

Coppal House has gotten their feed costs to \$5.10 per chicken. While this is higher than Chick Farm, it makes sense that there is a discrepancy. Because Coppal House is buying in smaller increments, a difference would be expected. Average feed cost for Jeremiah was \$16.625 per chicken. As a result of the vast difference between other farms, I will develop a strategy for combating this difference in section 5.2.

Depreciation

All of the farms contained within this analysis relied on their CPA to provide insight on purchasing large equipment and other assets. Accordingly, the depreciation schedules were handled solely by the CPA and taken care of as necessary. There was no indication that the farms needed to improve or modify the current systems in place.

Budgets

Very few of the farms I looked at developed and monitored budgets. Bison Project found it unnecessary to spend time creating budgets and felt that the end result would not be worth the time. For Rick and Marilyn of Chick Farm, they too do not keep budgets. They both felt that their time would be better spent tending the farm, rather than developing budgets. Coppal House, at present, does not have any budgets. In the future, however, they hope to begin development of a few to help foster better results. The remaining farms, Kelly Orchards, Meadow's Mirth, and Riverslea Farm have created and perfected their budgets over the seasons. The three farms mentioned above know the value their budgets provide for their businesses and work continually to make improvements. Because of the large number of farms that are not utilizing budgets, I will look for ways to explain the importance of budgeting and hopefully motivate the farms to create budgets of their own.

Cost Allocation

None of the farms I visited spread costs over entities which shared those costs. As an example, a barn heated for sheep, chickens, and goats could have the cost of

heating spread over the three enterprises contained. This could either be done by square footage or by animals contained. While one way may seem more representative than the other, both help show how the cost is spread over enterprises. Unfortunately, this kind of analysis was not done, and as a result, a better understanding of costs per enterprise could be developed. Because of this, I will be working on creating ways that the farmers can easily spread costs for expenses shared by enterprises.

Spoilage, Rework, Scrap

Throughout the analysis, I encountered some ingenious ways of mitigating spoilage, and scrap products. There were no instances where I witnessed practices which would foster additional consideration. Accordingly, I do not see any need to seek improvement in this topic.

Pricing

In order to understand appropriate pricing, the farmers referenced competitors both in their direct competitive landscape, as well as in conventional marketplaces. As long as the farms continue to cross-reference prices and compare on a larger scale, this model seems effective. No additional analysis is necessary.

Inventories

Inventory systems were lacking at nearly every farm contained within this analysis. Accordingly, it is important to focus on the importance of inventory tracking. Simplistic inventory systems will be developed for the farms in the following analysis in section 5.2.

Customer Profitability Analysis

While many of the farms have secured wholesale accounts, very rarely has thorough analysis been completed to insure the profitability of the relationship. Accordingly, it is important to gain an understanding of such business ventures. Kelly Orchards, Meadow's Mirth, and Chick Farm hold accounts that require special care.

5.2 Implementation of Given Suggestions

Cost of Feeding Livestock

A wide array of literature on chicken feeding is available online or at the library. Many different organizations have published findings regarding proper feed rationing and associated costs. Since so much information is available, understanding which sources to use can be daunting. Many of the sources I referenced were specifically for non-conventional chicken operations and did not fall under the classification "backyard farm". The sources used referenced the importance of tracking weight of the birds and careful feed monitoring. Feed can be rationed according to desired weight and by chicken variety. Certain breeds grow faster by design, and as a result, require less feed to grow to a certain point. By rationing feed from birth, farms like Jeremiah can more effectively monitor and control costs.

Budgets

The Wiswall Analysis cited in section 2.4 provides comprehensive tools to better create and modify budgets for a business. While many see the templates provided as useful only to growers, animal growers can also find value in the templates.

Because of the complexity associated with proper budgeting, certain stress is usually associated with the process. By utilizing and growing comfortable with the templates of the Wiswall Analysis, the fear of budgeting can be alleviated and the farmers can begin to see value in the end result. Overall, showing the need for budgets is initially most important. Secondly, motivating the farm to create budgets which will foster improved understanding is additionally important. As said above, the first step in this process is educating the farmers on the importance of budgeting and explaining the benefits derived from proper budgeting techniques.

Cost Allocation

For mixed-use facilities like the barns at Chick Farm, Coppal House, and Riverslea Farm, it is important to understand how costs are shared by enterprises. For a business like Riverslea, a barn can contain chickens, goats, and sheep. Accordingly, the heating of the barn is also a shared expense. Understanding how much of that cost is absorbed by each enterprise is important.

A simple analysis could begin by spreading the costs in terms of relative square footage. For example, if the barn is 1000 square feet and the chickens, sheep and goats each take up 100, 250, and 300 square feet respectively, we could say that 650 square feet is utilized by livestock, 350 square feet is utilized by non-livestock, and use a percentage of total livestock utilization to determine how much of the heating cost should be allocated to each enterprise. If the heating bill was \$1000 per month in the winter months, this analysis would say that roughly 16% of the cost would be allocated to the chickens, 38% would be allocated to the

sheep, and 46% of the cost would be allocated to the goats. While this method is relatively straight forward, it can be incredibly helpful in understanding true use of costs. Similarly, an analysis for trees could be completed using square feet to spread costs.

Inventories

Because inventories are not found within any of the farms analyzed, the first step in improving these systems is to educate the farmers on the importance of inventory analysis. Educating the farmers will help instill understanding and promote the need for such systems. Once this is completed, implementation of systems to foster inventory tracking can be made.

Since all of the farmers participate in local farmers markets, creating simplistic inventory systems to be used at market is a wonderful first step. Before each market, the farm will have an item in, item out check list which will track all items going to market. This checklist can be as simple or as complex as the farmer desires. Optimally, the list will track product name (such as boneless breasts), number of units, and weight of each package. The farm could also go as far as to weigh each unit and affix the associated price. While the item would still need to be weighed for the customer, fewer steps would be necessary at market, simplifying the process.

Once the item-in, item-out list has all units going to market, the farm would be ready to make the trip. Once a sale occurs, the farmer would check off the item sold, according to type and weight. They could also cross-reference the price that should have been charged and the price charged. When market is done,

the items in the cooler should match items not checked off on the list. As long as the two reconcile, the cash drawer should also match the checklist. Another important feature of this checklist will be supply and demand insight. If a farm brings 10 packages of boneless breasts and only sells 2, the farm can utilize that cooler space differently next time. Additionally, if the farmer brings 5 whole chickens and 14 customers request whole chickens, the farmer knows to allocate additional cooler space to whole chickens at the next market. The benefits of this inventory system go as far as the system is developed. Even if the system is as simple as tracking items by name and how many items were brought, this important supply and demand tracking can still be accomplished. As explained above, a farm can make the system as simplistic or complex as desired, and with that will come the benefits.

6.0 Closing Remarks

6.1 Thoughts on Initial Hypothesis

In the beginning, I thought that by diversifying the farm listing, a more concise, logical comparison between farms would emerge. My hopes were that, regardless of farm focus, products, or location, the central accounting practices would be the same. Unfortunately, such a comparison was more difficult to formulate than was anticipated. In the end, I sought to find “common denominators” by which to compare the farms. Since those denominators were not present in many of the farms, this limited the analysis to only three farms, instead of including all seven.

6.2 Conclusions

I found the process of completing this project incredibly informative and eye-opening. Because the original plan did not pan out as anticipated, I found myself thinking on my feet from time to time. When things went different than planned, I was able to work through the difficulty and reroute.

Since I was able to work predominantly in the field, the hands-on experience was a wonderful learning opportunity. I was not only able to learn about farming in general, but how accounting ties in and allows such businesses to flourish and continue forward. Not only was I able to gain this experience, but I was also able to establish a diverse network of industry experts who were able to pass onto me their knowledge of how accounting systems work within their

business. Furthermore, I was able to work on my time-management skills and learn how to best utilize data from my farm interviews.

While this project was highly beneficial to me, it also has larger implications for the farming community. As I mentioned above, many farmers I have interviewed have expressed interest in gaining a better understanding of their business through use of financial data. My hope is that through this project I was able to shed light on areas which farmers previously lacked understanding.

In summary, my thesis project was important not only because of the opportunities it has allowed me, but also because of the potential to increase and improve the understanding of farmers throughout the region, regarding their own businesses.

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