

A COST ANALYSIS OF THE ADDITION OF AN ONION PROCESSING LINE TO
TAYLOR FARMS: SALINAS, CALIFORNIA

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Taylor Farms: Salinas, California

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ABSTRACT

Taylor Farms has been one of the leading foodservice companies for the past 17 years. It is looking to expand its operations to include a line that would process red and yellow onions. To determine if this expansion would prove to be profitable, a projected budget for three scenarios was created. The scenarios were formulated to account for the “normal” base period, a “worst” case scenario, and a “best” case scenario. These three scenarios would account for periods where revenues and expenses were either higher or lower than the expected averages. The initial start-up costs as well as expenses of day-to-day operations and revenues were projected for each scenario for the period of 2012 to 2017. The addition of the line would prove to be profitable if the cost of start-up was covered within a 5-year period and the internal rate of return was 7% or higher.

The analysis of the projected budgets determined that the “normal” case scenario would cover the initial start-up cost around June of 2017. This would be within the 5-year period, and yield an internal rate of return was only 4.64%. The “worst” case scenario showed negative net incomes and over the time frame would only pay off 4.76% of the initial start-up cost. The internal rate of return was much lower at only 2.06%. The “best” case scenario projected that the initial start-up cost would in fact be paid in full by the end of February of 2014. The internal rate of return was 11,767.77% for the period of 2012 to 2017.

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Chapter 1

INTRODUCTION

The bulb onion originated from the area comprising Afghanistan, Iran, and the southern portion of the former Soviet Union. Onions are part of the genus *Allium*, which is extremely diverse, containing over 600 species of perennial and biennial pungent bulbous plants including garlic, leek, and chive. Goldman (2002) found that the bulb onion, *Allium cepa*, is the most widely cultivated of the edible species. This species of onion has been cultivated for over 5,000 years by farmers throughout various temperate zones. Griffiths (2002) noted *Allium cepa* is no longer known in the wild and may have either become extinct or be a hybrid from ancient civilization.

Bulb onions spread through Asia to Europe and then were introduced to the United States by European immigrants. For three centuries, the onion population in the United States was maintained as an open-pollinated population. This meaning pollination is by wind, birds, insects, or other natural mechanisms. An effort was then made to improve the quality of the onion through breeding programs. Goldman (2002) indicated that four founding breeding populations make up the majority of modern onion germplasm used in the United States today. These include 'Danvers Yellow Globe,' 'Valencia,' 'White Bermuda,' and 'Spanish.'

Onions are most commonly used as a vegetable ingredient that adds taste and flavor to many recipes. Onions are often used in salads because of their unique taste that can be described as is intensely pungent with a sharp bite. Onions have the versatility to be used in all types of

food, unlike many other ingredients. Per capita onion consumption has risen over 70%, from 12.2 pounds per person in 1982 to 20 pounds in 2009 (National Onion Association, 2011). Due to rising grower prices observed in 2009 and 2010, onion plantings in 2012 were expected to increase by 14 percent across the U.S. (National Onion Association, 2011). This widespread increase in demand has increased potential opportunities for foodservice companies selling products to distributors such as U.S. Foodservice, Sysco, and Produce Alliance. These distributors are part of a large network across the United States including many popular restaurants and fast-food establishments such as Taco Bell, Chipotle, McDonalds, and Pizza Hut.

This growing market has been identified as a potential area of profit for many foodservice companies, such as Taylor Farms in Salinas, California. Taylor Farms has established itself as the largest value-added produce company in North America. The company reported revenues of \$1.1 billion and an operating income of \$26 million in 2008 (Bell, 2008). Recently, Taylor Farms has expressed interest in expanding its operations to include a new onion processing line in its production facilities. The new onion processing line at Taylor Farms will top and tail the onions, a procedure that removes the roots as well as the upper unwanted portion of the onion. The processing line will also remove the skin from the onions. This is accomplished by a machine slicing a small incision on the outer layer of the skin, and then using a high pressure air jet to completely remove the skin. The final step will be various sliced, chopped, or diced cuts made by specialized machines. These cut sizes and quantities will vary based on customer demand. By installing a new onion processing line, Taylor Farms could diversify its commodity line and cover one more aspect of the menu for its many distribution customers. Many distributors would find it desirable to purchase onions from Taylor along with their lettuce,

cabbage, carrots, and other current produce needs. The option of purchasing onions from Taylor Farms could potentially cut down on freight costs to customers, as well as facilitating the ordering process and time spent on orders for distributors, saving them money. Logistically, it would make transportation much more cost effective by having produce in route on the same truckload as opposed to on trucks scattered across the United States. However, in order to accomplish this, Taylor Farms first needs to assess the current situation and determine whether this is just a trend or a potential long-run market.

Problem Statement

Will the addition of a new onion processing line to the Taylor Farms facilities in Salinas, California be profitable?

Hypothesis

The onion processing plant will yield an internal rate of return of 7% or higher. Within five years of implementation, the onion line will have covered initial start-up costs and produce positive income to Taylor Farms.

Objectives

- 1) To assess the costs of installing and operating an onion processing line capable of handling over 300,000 pounds of onions per day.
- 2) To assess the potential benefits/income from operations of a large scale onion processing line at Taylor Farms.
- 3) To evaluate how long it will take for Taylor Farms to begin profiting from this investment.

Justification

As a whole, agriculture in California employs approximately 443,900 people (Third Quarter, 2012). Burden (2011) stated that California is the number one producer of onions in the United States, supplying over 25% of the total U.S. production in 2010. Nearly 149,670 acres were harvested nationwide. The total value of onion production in 2010 was \$1.155 billion, up from \$1.05 billion in 2009 (Burden, 2011). This data cements the significance of the onion industry and the role it plays in the United States economy, specifically California's. The onion industry provides not only jobs, but also a reliable and safe food source for millions of consumers. The opportunity to become a part of this expanding industry and capitalize on market conditions is a goal for many companies, including Taylor Farms.

The results of this cost analysis will provide a sound resource for those interested in expanding into the onion processing industry as the value of production continues to increase. Information will be provided regarding the costs of installing and operating a large-scale onion processing line. Potential income from operations will also be made available. The combinations of these will determine whether or not this onion processing operation will be profitable after 5 years, and if not how long before it would be. This will give those interested in expanding into onion processing a base line to help make decisions.

Chapter 2

REVIEW OF THE LITERATURE

Foodservice Industry Trends

Per capita consumption of fresh vegetables has increased over the last 25 years. One of the major factors that can be attributed to this is the fact that the consumer has become more aware of the health benefits of fresh produce. A media driven society has educated the consumer on these potential benefits through many channels including television, radio, health programs, and school educational programs. As a result, fresh cut vegetable processors have been forced to adapt and evolve with this increased demand for product. The industry has experienced a demand for more conveniently cut and packaged produce items, as the consumer population has become more time-oriented. This challenge has been met with the evolution of post-harvesting techniques and distribution systems that have led to fresher products. This continued demand for convenient, higher quality products will undoubtedly be met by foodservice companies as a challenge in the coming years. Cook (2010) explains that as a result the industry will continue to grow, diversify, and become more efficient at what it does.

With these changes taking place, successful produce marketing companies will become more market driven. This will lead to advances in quality, packaging, product form, merchandising, and information to meet the specific needs of each market. Forward-looking companies will take the extra step and become more account driven, and will act as partners to

help meet the individual needs of each account. Many foodservice companies have already taken this step, as consumer specifications become increasingly strict (Cook, 2010).

Health Benefits of Onions

As mentioned earlier, one of the major reasons for increased consumption of fresh vegetables is the growing awareness of health benefits. Onions contain high levels of phytochemicals, which have been known to prevent various diseases such as cardiovascular disease, diabetes, Alzheimers, cataracs, cancer, and age-related functional decline (Griffiths, 2002). Onions contain two major groups of flavonoids, the flavonols and the anthocyanins. Flavonoids are plant-based compounds that have powerful antioxidant properties such as reducing inflammation, preventing aging, and reducing cellular damage (Temple, 2000). The flavonols are typically concentrated in the skin of the onion, where there is a yellow to brownish color, while the anthocyanins are usually found in the red pigment (Griffiths, 2002). Temple (2000) estimated that one-third of all cancer deaths in the United States could be avoided through proper diet modification. A proper diet modification would include receiving the required vegetable servings per day, which could be supplemented heavily with onions. A study conducted in Hawaii found that the consumption of quercetin in onions was inversely associated with lung cancer risk (Marchand, et al. 2000). The effects of onions seemed to be especially strong against squamous cell carcinoma.

Nutritional Facts

Darbyshire (1990) notes that water makes up approximately 80-95% of the fresh weight of onions. Of the rest of the onion, more than 65% of the dry mass may be in the form of non-structural carbohydrates. Onions store these non-structural carbohydrates in the form of fructan, a fructose base polymer. In contrast, low dry matter onions have lower levels of fructan but proportionately higher levels of glucose, fructose, and sucrose. An ordinary onion has only around 40 calories. Onions are a good source of dietary fiber, vitamin B6, folate, potassium, manganese, and vitamin C. The table below depicts the nutritional value of an onion into the following categories: nutritional value, vitamins, electrolytes, minerals, and phyto-nutrients.

Table 1: Onion Nutritional Facts

Nutrition value per 100 g.
(Source: USDA National Nutrient data base)

Principle	Nutrient Value	Percentage of RDA
Energy	40 Kcal	2%
Carbohydrates	9.34 g	7%
Protein	1.10 g	2%
Total Fat	0.10 g	0.5%
Cholesterol	0 mg	0%
Dietary Fiber	1.7 g	4.5%
Vitamins		
Folates	19 µg	5%
Niacin	0.116 mg	1%
Pantothenic acid	0.123 mg	2.5%
Pyridoxine	0.120 mg	9%
Riboflavin	0.027 mg	2%
Thiamin	0.046 mg	4%
Vitamin A	2 IU	0%
Vitamin C	7.4 mg	12%
Vitamin E	0.02 mg	0%
Electrolytes		
Sodium	4 mg	0%
Potassium	146 mg	3%
Minerals		
Calcium	23 mg	2%
Copper	0.039 mg	4%
Iron	0.021 mg	3%
Magnesium	10 mg	2.5%
Manganese	0.129 mg	5.5%
Phosphorus	29 mg	4%
Zinc	0.17 mg	1.5%
Phyto-nutrients		
Carotene-beta	1 µg	--
Cryptoxanthin-beta	0 µg	--
Lutein-zeaxanthin	4 µg	--

Processed Onion Marketing and Consumption

In the United States, the onion industry is a \$1.155 billion sector of the agricultural market (Burden, 2011). The majority of the time, onions are used as complementary items that add flavor. Onions bring new life and flare to dishes that are bland and need more depth and texture. The unique taste makes onions extremely versatile and popular across a wide variety of ethnicities and regions (Griffiths, 2002). There are two main types of onions that are marketed in the United States: pungent and sweet. In general, pungent onions have been used in cooking. These onions have white to yellow flesh and brown to yellow skins, or occasionally red and purple. The “sweet” onions are typically less pungent and are more attractive for fresh, uncooked use in dishes. Although the sweet, less pungent onions are becoming more popular, the more pungent onion still dominates the market. The reasons for this include that they have more flavor in cooked dishes, are easier to handle, and have a longer shelf-life (Griffiths, 2002).

Huang (et al., 2007) stated that onions now rank third in the United States for fresh vegetable consumption. In 1983 consumption per capita was 13 pounds and in 2005 it was nearly 21 pounds. The change is largely due to the increase in popularity of salad bars, salsa, and away-from-home-foods (Huang, et al., 2007).

Restaurants and distributors are demanding a wider variety of options available to them from the processors. Onions can now be purchased in a partially prepared form, such as sliced, diced, or chopped (Cook, et al. 2010). Processors offer multiple options for the size of the cut that is available to the consumer as well. The selection of products for sale makes it possible for the customer to purchase exactly what they want. Slicing and dicing onions removes the

majority of preparation for the consumer, making the process of utilizing them in dishes quicker and easier.

Competition in Processed Onion Industry

Gills Onions (Oxnard, CA) is one of the largest fresh onion processors in the state. Gills peels, slices, and dices more than 100,000 tons of fresh onions per year (French, *et al.*, 2009). French et al. 2009, found that approximately 37% of the onions processed cannot be used by the consumer and are discarded as waste. Concerned with building a sustainable environment, Gills has been making efforts to minimize waste. Originally they returned this waste to the soil through land application, but as volumes increased and waste costs rose, new ideas were needed (French, et al., 2009). Gills has now implemented a \$10.6 million proprietary process that converts nearly 300,000 pounds per day of onion waste into clean energy. The process extracts the juice from the onion peels and treats it in a high-rate anaerobic reactor to produce methane-rich biogas that powers two 300-kilowatt fuel cells. The electricity produced is used to power the onion processing plant, saving an estimated \$700,000 annually in electrical costs. This process reduces waste, opens new market opportunities, increases profitability, and improves the company's overall "green" image (French, *et al.*, 2009).

Cost Analysis

According to Sarabakos and Kosaropoulos (2002), an economic analysis of orange processing requires cost data and various calculations. The required data includes the depreciation of the fixed capital, the costs of the raw material, labor, and utilities. The cost of the

oranges is said to be the most important cost component, responsible for up to 70%. The cost is similar when processing onions, where the raw product is the largest portion of cost for the entire processing operation. This cost can be extremely variable due to weather conditions and agricultural policy or government price support. In extreme drought conditions, prices will rise drastically.

The total cost or fixed capital of a processing plant can be found estimated on the basis of the purchased cost of the main food processing equipment. Becker and Parsons (2007) note the cost of the food processing equipment, as a percentage of the fixed cost, is higher than the cost of chemical food processing equipment. Fixed costs include: the cost of equipment installation, piping, buildings and construction, electrical, instrumentation and control, engineering fees, and contingency. Evaluation of a plant 150% larger than his model, determined that “economies of scale generate processing cost reductions between 7% and 13%”(Becker and Parsons, et al., 2007). Based on this information, if there is room for increasing the total amount of onions processed, it would be advantageous because it would lower processing costs as Becker found.

Wampler’s (2011) cost-benefit analysis of installing solar panels, he discusses the three ratios that need to be calculated to determine if an investment will be profitable: the net present value should be greater than zero, the internal rate of return should be greater than the initial discount rate, and the cost-benefit calculation should be a positive number. He argues that the best way to measure this cost saving is to find the difference in the present value of total operating costs in the two cases and deduct the capital cost of the alternatives.

The IRR or internal rate of return is a calculation that is a form of break-even analysis. The IRR will indicate the highest discount rate a project can support before a negative NPV is

generated. The IRR is a good calculation to use if the size of a project is infinitely variable (Snyder, 2012). The IRR calculation for the onion processing line will show the rate of growth that the project is expected to generate.

Chapter 3

METHODOLOGY

Procedures for Data Collection

This study will use information that has been gathered from Taylor Farms' company records, accounting records, and personal interviews with the fresh cut vegetable manager (Marcus Shebl) at Taylor Farms. The costs of installing the onion processing line and also operating costs will be obtained from company financial budget records. The following information will be needed to create a budget: hours of operation daily, maintenance costs, production overhead costs, number of employees on the line, wages, cost of raw product, cost of onion packaging material, initial cost of machines, training for supervisors, total product output of machine, freight, and administrative costs. Each of these variables will be needed in order to compute the total costs of installing and operating the processing line.

The next piece of information that will be gathered in evaluating the onion processing line is income from operations. This information will be gathered from personal interviews with the fresh cut vegetable manager, Marcus Shebl, at Taylor Farms. The total revenue for the onion processing line will be computed based on a per pound basis.

Finally, the revenue and cost variables will be used to evaluate objectives one, assessing the costs of installing and operating an onion processing line capable of handling over 300,000 pounds of onions per day, and objective two, assessing the potential benefits/income from operations of a large scale onion processing line at Taylor Farms. These two parts are needed to formulate objective three, which is how long will it take Taylor Farms to make a profit from this

investment. This data will once again be gathered directly from Taylor Farms and will be evaluated over a baseline of 5 years.

Procedures for Data Analysis

The basic structure for the analysis of this study will use a budget format. The revenues and expenses will be entered into an excel template with formulas to calculate net income. The income statements created will be for the period between 2012 and 2017. It is important to note that for 2012, the income statement only reflects a two-month period as the onion line began operations in November. The years of 2013-2017 are projections based on data collected through the first 6 months of operation. Revenues and expenses for each year will be calculated based on a 52-week work year. Note that revenues and expenses will be calculated on a dollar basis per finished pound sold. For example, for each pound of finished product sold, the revenue generated will be \$0.7165/lb and the cost for freight will be \$0.08/lb sold. If 10 pounds of finished product were sold, the revenue will be a total of \$7.16 and the cost of freight will be a total of \$0.80. Through the first six months of operation the following data will need to be collected: Sales revenue, raw product, direct labor, freight, packaging, production overhead, and operating expense (SAG). The total cost for each of these categories will be summed over the six-month period. The total for each individual expense category will be divided by the total number of finished pounds sold, resulting in a cost per pound sold. For example, to find the cost per pound sold for freight expenses, the total number of pounds sold for the period would be divided by the total cost of freight in the same period. If 4,626,625 pounds of onions are sold and the cost of freight in the same period is \$390,047 then 4,625,625 is divided by \$390,047 to

find the cost of freight per pound sold, resulting in a \$0.0843/lb cost for freight. Each expense item and the revenue will follow this procedure until a per/lb cost and revenue is found for each. The resulting per/lb data components will then be used to extrapolate the remainder of the 5-year period. The income statement will show revenue minus all expenses. When the formulas have been completed, net incomes for each year will be available, and a payback period of the investment can be found.

Three tables will be used to display income statements for a normal period, “best case,” and “worst” case scenario. The normal period income statement depicts the current market place and is used as a base to evaluate the rest of the projections. The “best case” scenario projects for the best possible conditions that the operation could encounter. Revenues would increase and expenses would be lower than typical, giving a net income much higher than that of the “normal” base period. The “worst case” scenario depicts a market where all the expenses of operation increase. However, the “worst” case scenario also forces the price for finished product to rise based on raw product prices. If the cost per unit sold to the customer did not change, a much more drastic loss for net incomes for each year would be seen.

The variability of each item on the income statements for “best” and “worst” conditions was given by the fresh cut vegetable manager at Taylor Farms, based on his experience in the produce industry. The following are the potential changes that are projected for the “best case” scenario: Increase in revenues by \$0.40/lb, and decreases to raw product: Red onions \$0.04 and Yellow onions \$0.03, decrease in direct labor of 5%, decrease in freight of 20%, decrease in packaging of 5%, decrease in production overhead of 6%, and decrease in operating expenses (SAG) of 2%.

The conditions for the projections of the “worst” case scenario are the inverse of the percentages given for “best” case scenario, with expenses increasing, however keeping revenues constant. The only difference is seen in the raw product: Red onions increase \$0.75/lb and Yellow onions increase \$0.40/lb.

When making projections for the coming years, an increase of 5% for yield from raw product of 5% will be used, based on the premise that efficiencies will increase. However, the yield will reach a plateau and maintain at 72.9% of raw product. Also, income taxes will be 35% of income from operations.

When comparing the three scenarios of normal, “best,” and “worst,” it will be easy to see how the variation of expenses can affect the processing line’s chances of success. The net incomes will give a clear idea of profitability of the onion line and how each item on the statement affects the net income over the period of 2012 to 2017.

With the income statements complete, IRR and ROI can be calculated. Return on Investment (ROI) can be calculated using the following equations: Return on investment (%) = Net profit / Investment × 100 or Return on investment = (gain from investment - cost of investment) / cost of investment. This number will tell Taylor Farms the percentage of the investment that they are making back. Finally, there is the internal rate of return (IRR).

$$NPV = \sum_{n=0}^N \frac{C_n}{(1+r)^n}$$

After calculating the IRR, if the IRR is greater than the cost of capital, Taylor Farms should keep the onion processing line. If the IRR is less than the cost of capital, Taylor Farms should reject the project.

The final step is to see how long it would take to pay off the initial investment of \$3,625,000. By taking the net incomes of the time period, the breakeven point for the onion line can be determined comparing it to the cost of the initial investment.

Assumptions

This study assumes that there will be a variability of 5% for the cost of labor in Salinas. If there were potential labor shortages due to immigration issues, the cost of labor would increase drastically. This study also assumes that there will be normal weather and no issues with drought or natural disasters. A drought could result in loss of crop and an extreme shortage of onion supply, resulting in high prices for raw product. The most that raw product costs could increase by will be \$0.75 for red onions and \$0.40 for yellow onions. The assumption for the remainder of the expenses is that they will stay within the projected variability range that has been created, an increase or decrease based on the normal base period: Freight 20%, Packaging 5%, Production Overhead 6%, and Operating Expenses (SAG) 2%. Another assumption is that the yield from raw product will increase 5% each year, starting in 2012 at 52.9% and reaching a plateau of 72.9%, where it can no longer be improved.

Limitations

Limitations of the project are that data collected pertain to Taylor Farms in Salinas and may not be applicable to other companies in the industry. Production methods, machinery, and management styles are most likely different between companies and the results of a similar line could vary greatly.

Chapter 4

DEVELOPMENT OF THE STUDY

Analysis

The analysis of the onion processing line is broken down into three separate scenarios: a “normal” base period, a “worst” case, and a “best” case. The normal period accounts for normal market conditions, where there are no extreme changes in production costs or revenues. This scenario is used as the base line to make all other projections on the income statements. The “worst” case scenario accounts for a period where Taylor Farms would be in the worst condition possible. Expenses of the onion processing line would be much higher than typical. The “best” case projects a period in which expenses are lower than the base period and revenues are higher. Net incomes will be much higher in this case. The reason for creating the three separate sets of income statements is to account for any possible variability in the expenses and revenues, giving a more realistic set of results to make decisions.

Table 2: Projected Income Statement for 2012-2017, “Normal” Scenario

Taylor Farms				
Income Statement				
For the Year Ended Dec 31, 20XX				
Revenue	2012	2013	2014	
Sales Revenue	\$ 1,224,307	\$ 7,860,563	\$ 8,539,097	
Expenses				
Cost of Goods Sold				
Raw Product	\$ 515,291	\$ 3,788,523	\$ 1,570,499	
Direct Labor	\$ 253,282	\$ 1,881,523	\$ 1,881,523	
Freight	\$ 113,764	\$ 845,101	\$ 845,101	
Packaging	\$ 105,958	\$ 787,119	\$ 787,119	
Production Overhead	\$ 215,912	\$ 1,603,914	\$ 1,603,914	
Total Cost of Goods Sold	\$ 1,204,206	\$ 8,906,179	\$ 6,688,156	
Gross Profit	\$ 20,101	\$ (1,045,616)	\$ 1,850,941	
Operating Expenses (SAG)	\$ 47,231	\$ 350,856	\$ 350,856	
Total Operating Expenses	\$ 47,231	\$ 350,856	\$ 350,856	
Operating Income Before Taxes	\$ (27,130)	\$ (1,396,472)	\$ 1,500,085	
Less Income Tax From Operations	\$ -	\$ -	\$ 525,030	
Net Income	\$ (27,130)	\$ (1,396,472)	\$ 975,055	
Revenue	2015	2016	2017	
Sales Revenue	\$ 9,217,631	\$ 9,896,165	\$ 9,896,165	
Expenses				
Cost of Goods Sold				
Raw Product	\$ 1,570,499	\$ 1,570,499	\$ 1,570,499	
Direct Labor	\$ 1,881,523	\$ 1,881,523	\$ 1,881,523	
Freight	\$ 845,101	\$ 845,101	\$ 845,101	
Packaging	\$ 787,119	\$ 787,119	\$ 787,119	
Production Overhead	\$ 1,603,914	\$ 1,603,914	\$ 1,603,914	
Total Cost of Goods Sold	\$ 6,688,156	\$ 6,688,156	\$ 6,688,156	
Gross Profit	\$ 2,529,475	\$ 3,208,009	\$ 3,208,009	
Operating Expenses (SAG)	\$ 350,856	\$ 350,856	\$ 350,856	
Total Operating Expenses	\$ 350,856	\$ 350,856	\$ 350,856	
Operating Income Before Taxes	\$ 2,178,619	\$ 2,857,152	\$ 2,857,152	
Less Income Tax From Operations	\$ 762,517	\$ 1,000,003	\$ 1,000,003	
Net Income	\$ 1,416,102	\$ 1,857,149	\$ 1,857,149	

The table above is the set of income statements for the “normal” base period between 2012 and 2017. The revenues and expenses in 2012 are much lower than the following years because it accounts for only November and December, as the processing line started operation in November. The revenue was calculated for each year by multiplying the revenue/lb by the total amount of pounds sold in that year. Revenue/lb was determined by taking the total pound of onions sold in the first six months of production, then dividing this number by the total revenue

of the same time period. The result was \$3,314,783 of total revenue divided by 4,626,675 total lbs sold, giving a revenue/lb of \$0.7165. In the first full year of production (2013), 10,971,539 pounds of onions were sold, so the revenue was 10,971,539 multiplied by \$0.7165 producing a total revenue of \$7,860,563. In each year following, the yield from raw product increased by 5% until it reached a plateau at 72.9%. The revenues from 2014 to 2017 account for this change in yield, as revenues increase until the plateau is reached in 2017.

The cost for raw product/lb was determined by the same process as the revenue/lb, however total raw product cost had to account for both red and yellow onions, which have different costs. The total cost for raw product was found by combining the individual cost for the red and yellow per pound and multiplying this by the total pounds sold of each per year. The raw product cost in 2013 is high due to current market conditions, forcing prices to skyrocket. In 2013 the red onion cost was approximately \$0.53/lb and the cost of yellow onion was at \$0.26/lb, combined to total \$3,788,523. However, based on the projections for better market conditions, the prices for 2014-2017 are much lower at \$0.135/lb for red onions and \$0.185/lb for yellow onions.

Direct labor, freight, packaging, production overhead, and operating expenses (SAG) were all calculated in the same manner as described above. A cost per pound was found for each item. This cost/lb was then multiplied by the total number of pounds sold in that year, increasing at 5% until reaching a maximum yield at 72.9% in 2016.

Once all the revenues and expenses had been calculated, gross profit was found by subtracting the total cost of goods sold from the revenue. Total Operating expenses were then subtracted from the gross profit, resulting in an operating income before taxes. Depending on

whether or not the year had a positive income, a tax rate of 35% was applied and then subtracted from the operating income before taxes, yielding net income.

The net income for the years of 2012 and 2013 was negative, however 2014-2017 saw positive incomes. The total net income from the onion processing line summed over the 6-year period was \$4,681,853. Based on the initial investment cost of \$3,625,000, the onion processing line would cover the start-up costs and begin to make profit around June of 2017.

The IRR for the time period was 4.64%. This was calculated using the initial investment costs and the inflows of net income in each year.

Table 3: Projected Income Statement for 2012-2017, “Worst” Case Scenario

Taylor Farms				
Income Statement				
For the Year Ended Dec 31, 20XX				
	2012	2013	2014	
Revenue				
Sales Revenue	\$ 1,224,307	\$ 11,191,814	\$ 12,249,179	
Expenses				
Cost of Goods Sold				
Raw Product	\$ 515,291	\$ 7,100,661	\$ 7,100,661	
Direct Labor	\$ 253,282	\$ 1,975,599	\$ 1,975,599	
Freight	\$ 113,764	\$ 1,014,121	\$ 1,014,121	
Packaging	\$ 105,958	\$ 826,475	\$ 826,475	
Production Overhead	\$ 215,912	\$ 1,700,149	\$ 1,700,149	
Total Cost of Goods Sold	\$ 1,204,206	\$ 12,617,005	\$ 12,617,005	
Gross Profit	\$ 20,101	\$ (1,425,190)	\$ (367,826)	
Operating Expenses (SAG)	\$ 47,231	\$ 357,873	\$ 357,873	
Total Operating Expenses	\$ 47,231	\$ 357,873	\$ 357,873	
Operating Income Before Taxes	\$ (27,130)	\$ (1,783,064)	\$ (725,699)	
Less Income Tax From Operations	\$ -	\$ -	\$ -	
Net Income	\$ (27,130)	\$ (1,783,064)	\$ (725,699)	
Revenue	2015	2016	2017	
Sales Revenue	\$ 13,306,544	\$ 14,363,908	\$ 15,421,273	
Expenses				
Cost of Goods Sold				
Raw Product	\$ 7,100,661	\$ 7,100,661	\$ 7,100,661	
Direct Labor	\$ 1,975,599	\$ 1,975,599	\$ 1,975,599	
Freight	\$ 1,014,121	\$ 1,014,121	\$ 1,014,121	
Packaging	\$ 826,475	\$ 826,475	\$ 826,475	
Production Overhead	\$ 1,700,149	\$ 1,700,149	\$ 1,700,149	
Total Cost of Goods Sold	\$ 12,617,005	\$ 12,617,005	\$ 12,617,005	
Gross Profit	\$ 689,539	\$ 1,746,903	\$ 2,804,268	
Operating Expenses (SAG)	\$ 357,873	\$ 357,873	\$ 357,873	
Total Operating Expenses	\$ 357,873	\$ 357,873	\$ 357,873	
Operating Income Before Taxes	\$ 331,666	\$ 1,389,030	\$ 2,446,395	
Less Income Tax From Operations	\$ 116,083	\$ 486,161	\$ 856,238	
Net Income	\$ 215,583	\$ 902,870	\$ 1,590,157	

The table above shows the “worst” case scenario that the onion line could see from 2012-2017. This was created to help Taylor Farms plan for the worst possible conditions that could be seen and allow them to plan accordingly. All of the items on the income statement were projected using the “normal” period as a guideline for the calculations. The changes in the items

are as follows: Revenue will increase \$0.40/lb, raw product will increase \$0.40/lb for yellow onions and \$0.75/lb for red onions, direct labor will increase 5%, freight will increase 20%, packaging will increase 5%, production overhead will increase 6%, and operating expenses (SAG) will increase 2%. These projected changes are relevant due to the variability in the produce industry.

The revenue per pound increases in the “worst” case scenario due to the fact that foodservice companies must raise their selling price in response to change in raw product prices. If they do not, then the net income will be dramatically affected and most likely become negative. With this increase, the total revenue/lb would be \$1.11/lb, however the amount of total finished product sold stayed at the same level as the “normal” period.

Raw product was calculated by increasing the cost for yellow onions by \$0.40/lb and red onions by \$0.75/lb. This increase could be applied due to reasons such as drought, natural disasters, and other events causing shortages of onions. The cost per pound was multiplied by the total pounds sold for the year.

All other costs that are in the form of percentages were calculated simply by extrapolating data based on the “normal” period. For example, the direct labor is projected to increase 5% each year. To calculate the direct labor cost used for the “worst” case scenario, the direct labor cost from the “normal” period of 2013 was taken, (\$1,881,523) and multiplied by 1.05, resulting in \$1,975,599. This new cost for direct labor accounts for any potential changes that may take place.

The remainder of the expense items were calculated using the method described above. The necessary pieces were taken from the “normal” income statements and multiplied by the respective percentage increase in order to find the new projected expenses.

Based on these projected changes, the “worst” case scenario has only 3 years in which it has a positive net income. The total sum of all the net incomes over the period of 2012-2017 is only \$172,716. With the initial start-up of the onion processing line costing \$3,625,000, the processing operation would only cover 4.76% of the initial cost.

The IRR for the time period was 2.06%. This was calculated using the initial investment costs and the inflows of net income in each year.

Table 4: Projected Income Statement for 2012-2017, “Best” Case Scenario

Taylor Farms				
Income Statement				
For the Year Ended Dec 31, 20XX				
Revenue		2012	2013	2014
Sales Revenue		\$ 1,224,307	\$ 11,191,814	\$ 12,249,179
Expenses				
Cost of Goods Sold				
Raw Product	\$ 515,291		\$ 1,226,326	\$ 1,226,326
Direct Labor	\$ 253,282		\$ 1,787,447	\$ 1,787,447
Freight	\$ 113,764		\$ 676,081	\$ 676,081
Packaging	\$ 105,958		\$ 747,763	\$ 747,763
Production Overhead	\$ 215,912		\$ 1,507,679	\$ 1,507,679
Total Cost of Goods Sold		\$ 1,204,206	\$ 5,945,296	\$ 5,945,296
Gross Profit		\$ 20,101	\$ 5,246,519	\$ 6,303,883
Operating Expenses (SAG)	\$ 47,231		\$ 343,839	\$ 343,839
Total Operating Expenses		\$ 47,231	\$ 343,839	\$ 343,839
Operating Income Before Taxes		\$ (27,130)	\$ 4,902,680	\$ 5,960,044
Less Income Tax From Operations		\$ -	\$ 1,715,938	\$ 2,086,016
Net Income		\$ (27,130)	\$ 3,186,742	\$ 3,874,029
Revenue		2015	2016	2017
Sales Revenue		\$ 13,306,544	\$ 14,363,908	\$ 15,421,273
Expenses				
Cost of Goods Sold				
Raw Product	\$ 1,226,326		\$ 1,226,326	\$ 1,226,326
Direct Labor	\$ 1,787,447		\$ 1,787,447	\$ 1,787,447
Freight	\$ 676,081		\$ 676,081	\$ 676,081
Packaging	\$ 747,763		\$ 747,763	\$ 747,763
Production Overhead	\$ 1,507,679		\$ 1,507,679	\$ 1,507,679
Total Cost of Goods Sold		\$ 5,945,296	\$ 5,945,296	\$ 5,945,296
Gross Profit		\$ 7,361,248	\$ 8,418,613	\$ 9,475,977
Operating Expenses (SAG)	\$ 343,839		\$ 343,839	\$ 343,839
Total Operating Expenses		\$ 343,839	\$ 343,839	\$ 343,839
Operating Income Before Taxes		\$ 7,017,409	\$ 8,074,774	\$ 9,132,138
Less Income Tax From Operations		\$ 2,456,093	\$ 2,826,171	\$ 3,196,248
Net Income		\$ 4,561,316	\$ 5,248,603	\$ 5,935,890

The table above is the set of income statements for the “best” case scenario for the period of 2012-2017. All calculations seen above are projections that use the “normal” period as a baseline. The “best” case scenario projects for conditions in the produce industry that allow for

revenues to increase and for all expenses to decrease. This is the best possible scenario that the onion processing would ever see, and net incomes are expected to be much higher than that of the “normal” period.

The raw product cost for red onions decreases by \$0.04/lb and the yellow onion cost decreases by \$0.03/lb. These assumptions are made based on the probability that there could be a potential surplus of onions, causing prices to decrease. The remainder of the calculations are made using the same process as the “worst” case scenario. The only difference is that all expenses decrease, rather than increase as seen in the “worst” case scenario. For example, the direct labor cost from the “normal” period of 2013 (\$1,881,523), would be multiplied by 0.95, yielding a new cost of \$1,787,447.

Based on the projections for the “best” case scenario, the onion processing line would see positive net incomes in each year after the initial start-up in 2012. Net incomes are much higher than that of the “normal” period, with a total of \$22,779,449 over the period of 6 years. The initial cost of \$3,625,000 could potentially be paid off by the end of February of 2014.

The IRR for the time period was 11,767.77%. This was calculated using the initial investment costs and the inflows of net income in each year.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The objective of this study was to determine whether the addition of an onion processing line would be profitable to Taylor Farms of Salinas. The expenses associated with the initial start-up of the operation were determined. The revenues for each year from 2012 to 2017 were determined. The variable and fixed costs of the processing line were projected for the years 2012 to 2017. Three separate scenarios were accounted for, giving Taylor Farms a more in depth look at the possible returns and costs of operating the onion line. The three scenarios were the “normal” base period, “worst” case scenario, and “best” case scenario. With the revenues and expenses determined, net income was calculated for each year of operation for the 2012 to 2017 time frame. The total net incomes of each year were compared with the initial start-up cost of \$3,625,000 to find a break-even point at which the company would begin to make profit. Internal rate of return was calculated for the “normal” scenario and then compared with the IRR of the “worst” and “best” scenarios.

Conclusions

Analysis of the onion processing line showed that the net incomes of the “normal” case scenario would break-even with the initial start-up cost around June of 2017. This would be within the 5-year period, proving the hypothesis to be correct. The internal rate of return was

only 4.64%, lower than that of the hypothesis at 7%. The “worst” case scenario showed negative net incomes and over the time frame would only pay off 4.76% of the initial start-up cost. The internal rate of return was much lower at only 2.06%. The “worst” case scenario would not allow for the onion processing line to break-even and make a profit before the end of 2017. The major factor affecting a positive net income was the raw product cost being much higher and accounting for the majority of the expenses. Under these conditions the hypothesis would be proven false. The “best” case scenario projected that the initial start-up cost would in fact be paid in full by the end of February of 2014. The decreases in expenses allowed for this scenario to be paid off the fastest. The internal rate of return was 11,767.77% for the period of 2012 to 2017. This scenario was by far the best return for the onion line and satisfied the hypothesis. The purpose for presenting these three scenarios was to show how the potential payback period for the investment could vary. The three data sets provide a baseline for the future and allow for comparison to make decisions.

Recommendations

Based on the initial start-up cost, projected revenues, and expenses for 2012 to 2017, the addition of an onion processing line to Taylor Farms of Salinas will prove to be a revenue enhancing operation. It would be recommended for Taylor Farms to make contracts with its onion suppliers for an extended period of time once prices begin to decrease. This would allow for a more stable cost of raw product and could help to control overall costs if market swings were to occur. It is also recommended to continue to increase the total amount of pounds each

year if the line has the capacity for it. Increasing the total production by 150% could decrease the processing costs from 7%-13%, and increase net incomes.

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