



The University of Georgia

Center for Agribusiness and Economic Development

College of Agricultural and Environmental Sciences

The Feasibility of Operating a Fresh Cut Facility in Decatur County, Georgia

Christopher Ferland, Kent Wolfe, and John C. McKissick
FR-02-02
January 2002



Feasibility of Operating a Fresh cut Facility in Decatur County Georgia

Purpose

This report examines the economic feasibility of operating a fresh cut facility for vegetables in the Decatur County Georgia area. The main focus of this report will focus on adding value to vegetable commodities such as sweet corn and carrots. The industry has successfully added value to these vegetables by removing their ends, peeling, and packaging them for convenience. Often sweet corn is seen in the produce section of stores with the tips removed and placed on a Styrofoam sheet with shrink wrap. This type of packaging increases the value received by the store, wholesaler, and farmer. However, the largest percentage of added value occurs in the packing component. Hence, the Decatur County group has requested the Center for Agribusiness and Economic Development to research the feasibility of operating a fresh cut facility.

This report examines the relevant economic issues surrounding the operation of a fresh cut facility. All costs were taken into consideration, even a small direct cost to the producers for delivery of the vegetables to the facility. The majority of this report consists of the marketing, finance, and impact analysis sections. Together these sections explain the feasibility of operating the facility.

Introduction to Fresh cut Industry

The fresh-cut industry has grown tremendously as consumers demand more convenient and processed foods. Fresh-cut refers to fresh produce that has been washed, cut, packaged, or processed in any way. Adding value to fresh produce through fresh-cut reduces consumer's food preparation time and activity. In exchange, consumers are willing to pay more for these convenience products.

According to Jim Grony, International Fresh-Cut Produce Association, there is a lack of product information on the fresh-cut industry. The only source of this information are current businesses operating in the market and are generally unwilling to provide this information due to the sensitivity of the data. Large scan data companies such as AC Nielsen and IRI, are starting to collect information on the fresh-cut industry but at this time, it is not available.

Mr. Grony mentioned that there are a number of large fresh-cut producers operating out of the Atlanta Metropolitan area. For instance, there are the Performance Foods, Fresh Express, and the Salad Factory to name a few. Mr. Grony indicated that the fresh-cut market is mature, even though it is still growing. In addition, he also indicated that the current participants are very proactive and continually updating their product lines to meet market demands.

Given the lack of information and data on the fresh-cut market, the Center for Agribusiness and Economic Development has had to rely on numerous sources for information and data.

Apparent Market Trends

Consumers have continued to increase their consumption of fresh fruit and vegetables and consider the quality of fresh produce as a principle factor in where they shop. Interestingly, grocery stores have seen fresh produce sales overtake the meat sales, which are traditionally considered to be the supermarket's most important department. This increase in consumption is reflected in grocery store produce availability. In 1999, the typical grocery store might carry an average of 431 produce items, up significantly from 173 in 1987¹. Fresh-cut items like bagged salad, shredded broccoli, and microwave-ready fresh vegetables, as well as other specialty products fueled new product growth. For instance, fresh-cut produce has grown from a non-existence in the early 1990's to an estimated 15% of average retail sales in 1999.

In addition to increased consumption, consumers are demanding out of season fresh produce and are willing to pay a higher price for it. As a result, grocery stores will have to develop relationships with suppliers that can provide fresh produce year around or for over-extended seasons. Given the demand for year round fresh produce and the greater number of produce items being offered, retailers are looking for relationships with suppliers that can provide a year around consistent and varied product line.

Another change that has impacted the fresh produce market is the fact that consumers continue to increase the number of meals they eat away from home. For example, in 1999 the food service sector captured 48% of the total food spending which is up from 44% in 1992 and 40% in 1982. Retailers are responding to this decline in consumer food spending by offering ready-to-eat meals, or as referred to in the industry as retail Home-Meal-Replacements or Meal Solutions. As a result, consumers are spending less time preparing at home meals and therefore convenience has become increasingly more important.

Consumers are spending less time preparing meals and are demanding convenience products. According to Lynn Heinze, Vice President of Information for the Nation Live Stock and Meat Board, the majority of consumers (two-thirds) want products that are quick, easy, and convenient, versatile and good tasting. Today's consumers are demanding easy to prepare foods with ease of preparation being the important food selection criteria. Consumers' prefer meals that are easy to make which produce leftovers to reheat and eat at a different time. A prime example is that 73% of the respondents in the National Pork Producers Council's 1998 *Kitchen Reports* use the microwave to prepare all or part of the evening meal on a daily basis compared to 70% using an oven/range.

Market Overview

Fresh-cut and value added vegetables have experienced phenomenal growth. The fresh-cut value added fresh produce category is the tenth fastest growing product category according to AC Nielsen's December 30, 2000 Market Track. Over the last year, the growth of this category has increased by 26% and accounts for \$31,684,000 annually. It is anticipated that in 2003, the fresh-cut product category will account for roughly 10% of the fresh produce market. Prior to the mid-1990s, the majority of fresh-cut produce was purchased by the food service sector. As a

¹ U.S. Fresh Fruit and Vegetable Marketing, AER -795, Economic Research Service, USDA.

result of the aforementioned factors, retailers are continually responding to consumers continued demand for more processed foods, by offering shoppers a choice in convenience and reduced preparation meal solutions. Industry research has found that between 62% and 84% of US consumers have purchased fresh-cut vegetables. The percentage of consumers that purchase fresh-cut fruit is significantly lower, 42%². Fresh-cut vegetables have moved past salads in annual sales and are expected to grow at a moderate rate over the next few years. A portion of the new growth in the fresh-cut vegetable market can be attributed to the introduction of new fresh-cut products like peeled carrots, baby spinach, and slaws.

Studies have shown that per-capita expenditures on fresh vegetables tend to be higher for one and two person households and tend to increase with the age of the head of household. In the packaged salad market, consumption tends to increase with household income and consumption increases in households with dual incomes and households headed by working women. For example, among consumers who purchased packaged salads at least twice a week, 65% had household incomes over \$50,000 where as only 35% of the US households have an annual income of \$50,000.

Consumers who purchase fresh-cut vegetables do so frequently. Over seventy-five percent of consumers reported they purchased fresh-cut vegetables in FMI's 1998 Trends report, indicated that they purchase fresh-cut vegetables at least once a month. An additional one-quarter of these consumers indicated they purchase fresh-cut vegetable at least once a week.

Four Major Consumer Trends:

1. Freshness - Freshness is interpreted as good quality (68% of survey respondents) and freshness is a prime factor in the selection of products at the retail level. Consumers equate quality with freshness.
2. Variety - Consumers are demanding more variety. As consumers are exposed to different foods via travel and restaurants, they are demanding a wider variety of food products they can prepare at home (e.g. Mexican, Cajun, Chinese).
3. Convenience - The increase of women in the workforce, single-parent families, higher income, higher education, and busier schedules all have contributed to the demand for more convenient foods that save time in meal preparation. (Average time spent cooking and waiting)
 - Approximately 2/3 of dinner decisions are made the same day the meal is eaten
 - Convenience is critical as the number of households that take less than 15 minutes to prepare a meal continues to increase
 - 40% of consumers do not know at 4:00 pm what they will have for dinner that night

²Fresh Cut Produce, Ference Weicker and Company. <http://www.fwco.com/produce.html>

- Approximately 68% of consumers say they will wait until the end of the day to decide what to prepare for dinner most or some of the time
 - 50% of consumers indicated that they are willing to pay more for convenience foods.
4. Nutrition and safety - A significant percentage of consumers are concerned with pesticides (71%) and chemical residues (68%). The recent food scares associated with food products has increased consumer concerns. Nutrition has become more important, especially to the aging baby boomer population.
 5. Consumers want quality, fresh produce year-around and they are willing to pay for it.

Technologies Impact on Fresh-Cut Industry:

1. Improvements in post-harvest technology, and handling have led to increased quality, better product presentation, and has extended the shelf life of fresh-cut produce. As better packaging materials have been developed, packaging has been developed that allows consumers to readily see the product and reduce concerns over purchasing packaged produce.
2. Product lines have been expanded and improved. In the 1990's the number of products being offered has increased significantly, as did consumers interested in variety. Fresh-cut produce may now include additional ingredients such as salad dressing, cheese, and other types of ingredients eaten with fresh produce.
3. Fresh-cut products are generally cleaner than "raw" produce. Fresh-cut produce is generally washed two or more times before it is presented to the consumer, which results in a cleaner product. More pesticides and other residues are washed away.

Supermarket Data

The CAED conducted an in-depth interview with a regional produce manager for a national food retailer. The results of the interview were very informative and provide valuable information. For instance, the most popular category of all of the fresh-cut and value-added vegetables is the bagged salad category. On a weekly basis, the value added vegetable category accounts for anywhere from 10-15% of fresh produce retail sales. The packaged salads outpace all others with packaged broccoli, cauliflower, and assorted vegetables, packaged greens such as collards, turnips, mustards, and mini peeled carrots. More value-added items such as vegetable trays and fruit trays are also good sellers, especially during the holiday season.

The interview also revealed that unique or innovative packaging that prompts consumers to purchase more produce is where the industry is heading. According to the produce manager, innovative packaging is effective in increasing sales as consumers purchased the packed produce

over the bulk produce leading to an increase in the products total sales. Stores are continually striving to increase product sales and packaging is one method of achieving this goal.

To obtain a better understanding of the current market, the CAED was able to obtain information from a national food retail chain with significant operations in Georgia. Sales volume data was collected for value-added and fresh-cut produce products. The information in Table 1 provides an estimate of Georgia’s total market potential for specific fresh-cut products. The national supermarket chain’s market share was used to estimate the remaining Georgia market for the various fresh-cut products. These products include bagged and tray pack products.

Carrots dominate the fresh-cut category in terms of product sales. Of the 19 products listed, various cut and package sizes of carrots and accounted for eight of the fresh-cut products. Bagged collard greens and shrink wrapped broccoli appear to be very popular and might provide an opportunity.

Table 1. Fresh-Cut Product Sales

Product	GA Retail Market Potential (lbs)	Wholesale Price
Carrots, baby peeled (1 lb)	2,134,937	\$ 1.05/lb
Carrots, mini peeled (2 lbs)	921,743	\$ 1.64/lb
Carrots, bagged (5 lbs)	770,501	\$ 0.32/lb
Carrots, bagged (2 lbs)	680,354	\$ 0.36/lb
Carrots, bagged (1 lb)	545,058	\$ 0.41/lb
Bagged collard greens (2 lbs)	470,039	\$ 1.03/lb
Broccoli, Shrink Wrapped 14 ct	401,927	\$ 1.90/4-pack
White sweet corn tray, 4 pack	329,434	\$ 2.70/4-pack
Yellow sweet corn tray, 4 pack	267,769	\$ 2.68/4-pack
Carrots, mini peeled (5 lbs)	181,352	\$ 0.84/lb
Carrots, bag (2 lbs)	127,215	\$ 0.36/lb
Turnip Greens, bagged (1 lbs)	114,164	\$ 1.54/lb
Carrots, bag (5 lbs)	112,052	\$ 0.32/lb
Radish, red (1 lb)	75,090	\$ 0.89/lb
Carrots, mini peeled (6- 3.oz bags)	70,857	\$ 1.35/lb
Broccoli Florets (1 lb)	46,990	\$ 1.42/lb
Sweet corn, bi color 4 pack tray	40,519	\$ 2.54/4-pack
Cauliflower Florets (3 lbs)	40,085	\$ 0.52/lb
Mustard Greens (1 lb)	32,802	\$ 1.53/lb

These products are currently being produced and supplied to Georgia’s supermarkets.

However, there does appear to be an established market for herbs and spices. The in-depth interview revealed that there is a need for a local supplier of herbs and spices. The information in Table 2 provides insight into the most frequently purchased herb and spice products.

Herbs & Spices	Units Sold	Wholesale Price
Cilantro, bunch	315,289 bunches	\$0.61 bunch
Parsley, bunch	386,483 bunches	\$0.68 bunch
Basil, carton	115,767 cartons	\$0.65 carton
Garlic (2 lbs)	53,278 pounds	\$1.27 pound
Garlic (2 oz)	15,705 pounds	\$2.83 pound
Dill Weed (½ oz)	1,202 pounds	\$20.69 pound
Rosemary (½ oz)	882 pounds	\$21.94 pound
Sage (½ oz)	354 pounds	\$21.96 pound
Oregano (½ oz)	198 pounds	\$21.84 pound

Herb and spice prices range from about \$0.61 per bunch for cilantro to about \$22 per pound for sage. These products might provide an opportunity to fill a niche market.

Fresh Cut-Produce Problems³:

Fresh-cut produce requires different handling and storage from traditional intact produce. Product deterioration is faster for fresh-cut produce than intact produce due to the wounding that occurs as the product is handled and processed. Fresh-cut produce may encounter visual problems resulting from water loss, oxidative browning, and microbial contamination. When a produce experiences a wound as a result of processing, the produce increases its production of ethylene and respiration, which may be linked to the product's wound healing process. The increase in ethylene can cause a host of problems ranging from accelerated membrane deterioration, toughening, undesirable flavor, aroma changes, and loss of vitamins. A wound provides microorganisms an entry point and may possibly increase the survival and growth of food poisoning microorganisms.

A problem of concern is the shelf life of the produce. According to Food Scientists, sweet corn shelf life after cutting is greatly diminished. The average longevity of packaged sweet corn ranges between 4-6 days depending on storage temperatures. Peeled carrot shelf life extends past the sweet corn but is still not substantial.

Industry Trends

In addition to the consumer driven market trends, there have been organizational forces at work that directly impact the fresh-cut produce industry. For instance, the industry has experienced consolidation at both the retail and wholesale levels. There are now established slotting fees for some fresh-cut products and barriers to entry have become more evident.

Barriers to Entry

The fresh-cut industry is capital intensive. For instance, a bagged salad facility may require an investment in excess of \$20 million for a processing plant. The capital intensive nature

³Post Harvest Quality and Safety in Fresh-Cut Vegetables and Fruits,

of fresh-cut processing facilities act as a barrier to entry. This is evident by the fact that there are relatively few firms in the bagged salad industry. In 1999, it was reported that there were 54 bagged salad operations in the United States. Even more revealing is that 76% of the bagged salad market was being supplied by two major operations.

There are other opportunities for fresh-cut operations, especially in the area of fruits and more perishable fresh-cut produce like chopped onions and tomatoes. For these highly perishable products, regional processors are able to take advantage of their proximity to nearby markets. Bagged carrots and packaged sweet corn serve this regional component because of their relatively short shelf life. However, a great deal of un-cut sweet corn is sent out-of-state.

Another barrier to entry besides the capital cost is consistent supply and shelf space. Large grocery stores and wholesalers demand a one year contract. In Georgia we can not produce sweet corn and carrots year long, so some issues may arise when seeking contracts with larger chains. In addition to year long supplies, a surcharge may be added for shelf space availability at certain stores.

Retail Consolidation

The retail/shipper relationship has been significantly impacted by the recent trend in retail consolidation. Consolidation has increased the market share for the larger grocery store chains. For instance, the four largest food retailer's market share has increased to 27% of grocery store sales in 1999, up from 18% in 1987. The top 20 food retailers now control 52% of grocery store sales, up from 39% in 1987. This is significant because supermarkets and grocery stores dominate fresh produce sales, these retail outlets sold 88.0% of all fresh produce compared to 5.0% for specialty food stores in 1997. As the number of supermarkets and grocery stores decline via mergers and acquisitions, the number of potential food retail customers declines. The same trend in consolidation has occurred in the wholesale business as well as grocery-oriented wholesalers. Given the flurry of acquisitions and mergers, the four largest food service wholesalers accounted for 21% of the market.

As a result of the food retailer consolidation, retailers are concerned with reducing procurement and marketing and distribution costs by purchasing more volume directly from large shippers. The retailers' rationale is that they hope to gain greater efficiencies in procurement by cutting out "middlemen" reducing per unit costs. Large retailers demand large volumes of consistent product to provide uniformity across all of their stores, which is typically handled by large shippers. To strengthen the relationship with large wholesalers that are able to provide large volumes of consistent product, retailers are offering preferential procurement agreements such as partnering, long-term agreements, and strategic alliances.

In response to this trend, grower-shippers are offering custom-pack and even custom-harvest services to retail buyers. In addition, grower-shippers are acting more as brokers (or consolidators) for their customers, putting together a variety of products from a variety of growers in order to provide both one-stop shopping and efficiencies in transportation.

The opportunity to co-pack for food retailers or other fresh-cut shippers appears to be a viable opportunity in terms of supplying food retailers. Unless a small fresh-cut operation has access to a consistent supply of high quality produce, it will not be able to provide food retailers with year around fresh-cut produce. This goes against industry trends. Therefore, private label or co-packing may provide a means of entering this market on a seasonal basis without concerns for offering year around product.

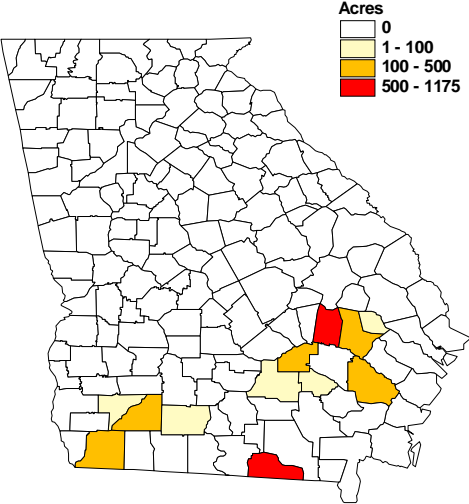
Food Retailer Fees

Getting a product into a food retailer is not as easy or without cost. According to research in the bagged salad industry, there appears to be increasing pressure to pay fees to obtain shelf space. One contributing factor to the rise of “fee” is that the average supermarket may carry upward to 20,000 products with thousands of new food products coming online each year. This situation has caused retailers to introduce multi-deck cases to better utilize linear space. As a result, shelf space competition has become more competitive and retailers have gained more negotiating power. This has given rise to slotting and other fees. A slotting fee is a lump sum payment, from a supplier to a retailer, for introducing a new product food retailers. A pay-to-stay fee is a fixed payment that keeps a product on the shelf. More traditional fees are also prevalent, such as per unit rebated or volume discounts. In addition, fresh-cut suppliers are committing more resources to in-store merchandising programs targeted to the needs of individual retailers.

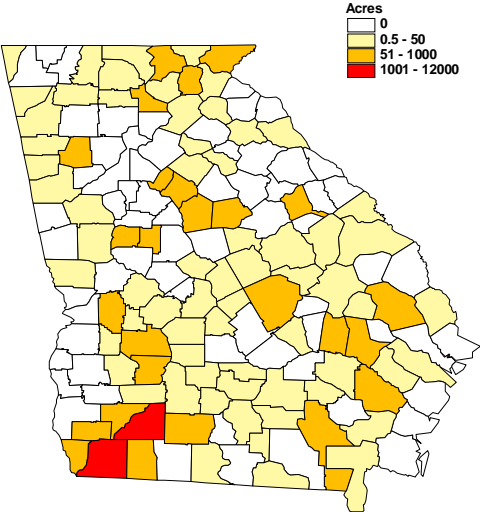
Fresh-cut produce is more susceptible to slotting fees than other fresh produce due to its nature. Value-added and fresh-cut produce items more like manufactured products than raw fresh produce in that it requires year around shelf space. Today's supermarket retailers are attempting to operate the produce department using the same principles and procedures as in the dry grocery department, as evidenced by the growing use of performance guidelines, category management, and supply contracts. Contracts are viewed as essential risk-management tools to ensure the availability of a minimum amount of product. This is substantiated by the results of a bagged salad shipper survey. The survey found that the majority of the interviewed bagged salad companies reported paying slotting fees at the request of the food retailer or including them in their contract bidding. The bagged salad shippers reported paying fees ranging from \$10,000 for small chain accounts to \$500,000 for a division of a multi-regional chain. Volume discounts range from \$0.10 to \$0.25 per carton of bagged salad. In addition, these firms reported that they sometimes pay advertising allowances and provide free products to new stores.

Vegetable Production in Georgia

Carrot Acreage by County, Georgia 2000



Sweet Corn Acreage by County, Georgia 2000



As seen in the maps above Decatur County does hold a comparative advantage in processing sweet corn and carrots due to the large acres of production.

Fresh Cut Facility Feasibility

This section will explore the components necessary for operating a fresh cut facility in Decatur County, Georgia. Equipment prices came from University of California Davis' Vegetable Research Center, Magnuson Corporation and other food processing companies found on the web. All prices are for new equipment FOB and do not include sales tax. Only sweet corn packing and peeling carrots was investigated for this feasibility report. Based on the market potential in Georgia, these vegetables offered the most positive opportunity. The equipment was based on the daily maximum rates of processing sweet corn at 9,000 ears a day and carrots at 10,000 pounds per day. The cost data and other numbers were supplied by various private groups, the University of Georgia's Department of Food Science, University of Georgia's Department of Biological and Agricultural Engineering, and University of Georgia's Department of Agriculture and Applied Economics. Before producers in the Decatur county area relinquishes existing supply contracts the break-even analysis of operating the fresh cut line needs to be examined. This allows for a profit/loss margin to be determined. Each vegetable was analyzed as stand alone and in conjunction with one another.

Three different scenarios were investigated for this report. A stand alone facility for just sweet corn, a stand alone facility for just carrots, and a combined facility for both vegetables. The combined unit is most economically for the fixed cost can be shared over more products.

Income

The income was derived by utilizing the full capacity of the operation daily for the appropriate vegetable season multiplied by currently prices of similar products on the market as found by research with wholesalers and grocery stores. The packaged price per pound was given to the researcher for sweet corn at \$.87 and carrots at \$.63. Sweet corn yields between 55-65% of the original weight used and carrots yield between 65-75% of the original weight used. Incorporating this information into the equation for the total income produced for the 27 weeks of the season is \$967,032 from approximately 1.2 million pounds of product. One issue seen by the researchers is the number of units produced by the facility equated to approximately all the units sold by Kroger in Georgia last year. The national food retailers chain controls 35% of Georgia's food retail business. The chain sold roughly 199,000 units of tray packed sweet corn or roughly 348,250 lbs during 2001. The facility may be over supplying the market place causing prices to decrease or limiting their number of sales. See Appendix page.

Capital Cost

The capital cost figures include all equipment considered necessary to operate a fresh cut operation (appendix). These costs include all necessary equipment for both carrots and sweet corn. Also, in the total cost figure are the prices for a metal building to house the operation and stand alone freezer. These costs came from a number of sources and can be found in the appendix of this study. The total figure for capital cost amounts to \$492,460; of which \$243,960 (including tax) is used for equipment, \$248,500 is used for the building/land and freezer, and \$150,000 is working capital to cover expenses prior to an "income producing" period.

Equipment:		Building/Land	
Peeler/Washer	\$25,000	2 Acre Site	\$15,000
Hooper, Scale, Dump	\$52,000	Steel Insulated Building	\$70,000
Product Loading Elevator	\$11,000	Cooling Unit	\$7,500
Segmentor (1 used)	\$24,000	Concrete Floor, 10"	\$40,000
Food Grade Equipment	\$12,000	Freezer	\$116,000
Silker	\$5,000		
Sweet corn Husker	\$42,000		
Shrink Wrap System	\$12,000		
Fork Lift	\$42,000		
Set Up (Consulting)	\$3000		

Direct Vegetable Cost

The figures for the carrots and sweet corn came from the Farmgate publication produced by the Center for Agribusiness and Economic Development. A price of \$0.14 per pound for both finished products was used to go directly to the producers regardless of sales, this figure was multiplied by the original pounds needed to reach 100% capacity. Due to the difference in shrink and waste a separate equation were used not a weighted average. The total direct cost amounted to \$480,240. This included transportation at a rate of \$.005 per pound. See Appendix page.

Fixed Costs

Fixed costs associated with this fresh-cut facility include the depreciation on the building, equipment, and interest on investment funds. The projected fixed costs for this project is \$116,025. The depreciation is used to cover physical deterioration and function obsolescence. Built into this model is a return on investments of 10%. If needed the depreciation can be substituted to cover the principals of a debenture. See Appendix page.

Direct Labor

Labor cost calculations include both salaried and hourly labor required to run the quick freeze line. The labor figures are automatically adjusted with an increase in pounds. The regular hours of operation are 8 hours per day, for 110 days of the harvest season. The wages for the laborers are calculated at \$6 per hour per employee (10) for 22 weeks of full-time (8 hour days). The manager/salesperson receives an annual salary of \$35,000 with the potential of commissions. This person is responsible for scheduling delivery of the #2's to the freeze line, ordering input supplies, and creating contacts for direct sales. The manager will be the only employee to receive benefits, estimated at \$8,750. A part-time bookkeeper, with an estimated salary of \$7,500, will be hired to assist the manager. The total labor cost is \$283,570 or \$0.24 per pound of finished product. If it is decided to run a custom vegetable processing line, additional labor figures will need to be calculated.

Variable Costs / Other Direct Costs

Variable costs associated with this project include labor, utilities, insurance, repairs, rental agreements, disposal, and operating costs. Operating costs include: boxes, cleaning supplies, and packaging. All of this will change depending on the pounds of product quick-frozen. Positive relationships exist among the pounds processed and the variable costs. The total for this category is \$63,270. The largest component of this cost was the utilities to operate the facility, freezer, and refrigerated rooms. Georgia Power provided the estimate on the electricity cost based on past performance and voltage requirements for the equipment.

Total Cost & Profit/Loss

Adding the variable and fixed costs together sums the total cost of \$938,881. This is the total cost of operating the fresh cut facility for 27 weeks and producing approximately 1.2 million pounds of vegetables. The processing line earns \$28,151 annually. The operating efficiency appears extremely low for an agricultural-based product. The operating efficiency refers to the amount of the income kept in the company. Out of every dollar the facility earns, \$.03 and \$.97 covers expenses. Co-packing other firms produce could be one aspect of the operation that may be able to produce additional income. Throughout the year large grocery store chains needs assistance repacking various vegetables, from onions to potatoes. The only costs needed to be covered would be the variable costs since fixed costs for the facility was absorbed by the sweet corn and carrots.

HAACP

If the packing facility markets directly to retailers who do not repack a HAACP plan needs to be implemented. Presently, the processing facility wishes to deliver large quantities to retail outlets and stores. The approximate cost for a HAACP plan ranges between \$3000-\$5000 for a single commodity plan. Additional products will increase the plan's cost. Further information can be obtained by contacting the Food Science and Technology Department at the University of Georgia.

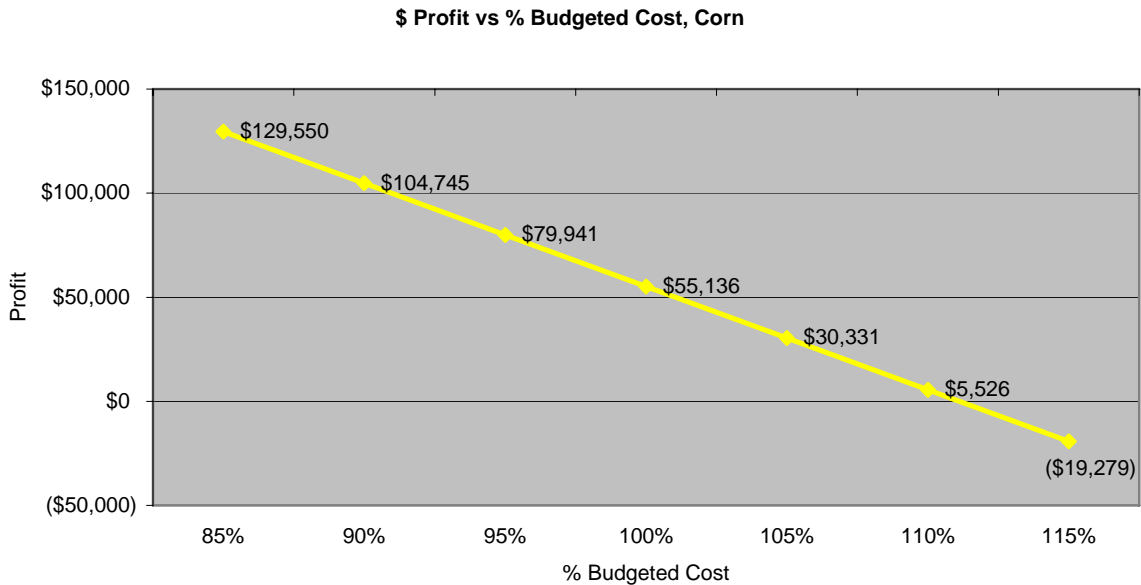
Sensitivity Analysis

Profit versus Budgeted Cost

Assuming the figures used in the economic feasibility section are closely related to actual numbers used to operate a quick freeze processing line, the profitability for the sweet corn and carrots. The first two graphs in this section are considered stand alone units while running the facility for just production of sweet corn or just production of carrots.

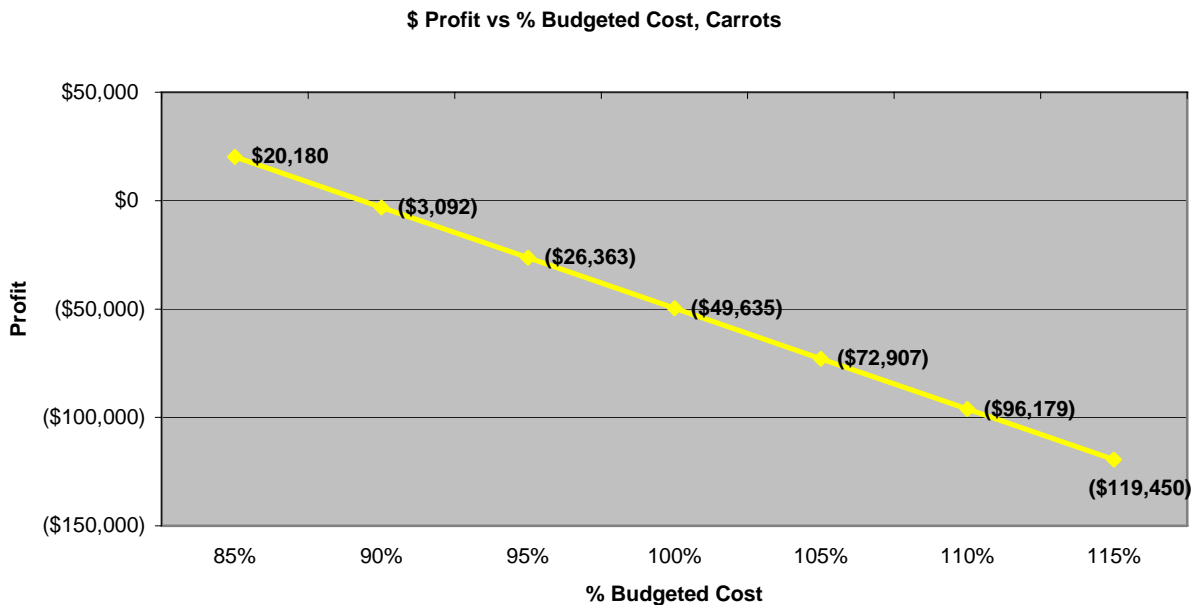
The budget numbers include operating expenses (utilities, taxes, labor, supplies), fixed costs (interest on start up cost, depreciation) and income from sales of processed sweet corn. Then the costs are subtracted from the income resulting in the remaining profit or loss.

Graph 1. Change in Profit versus Change in Budgeted Cost, Sweet corn.



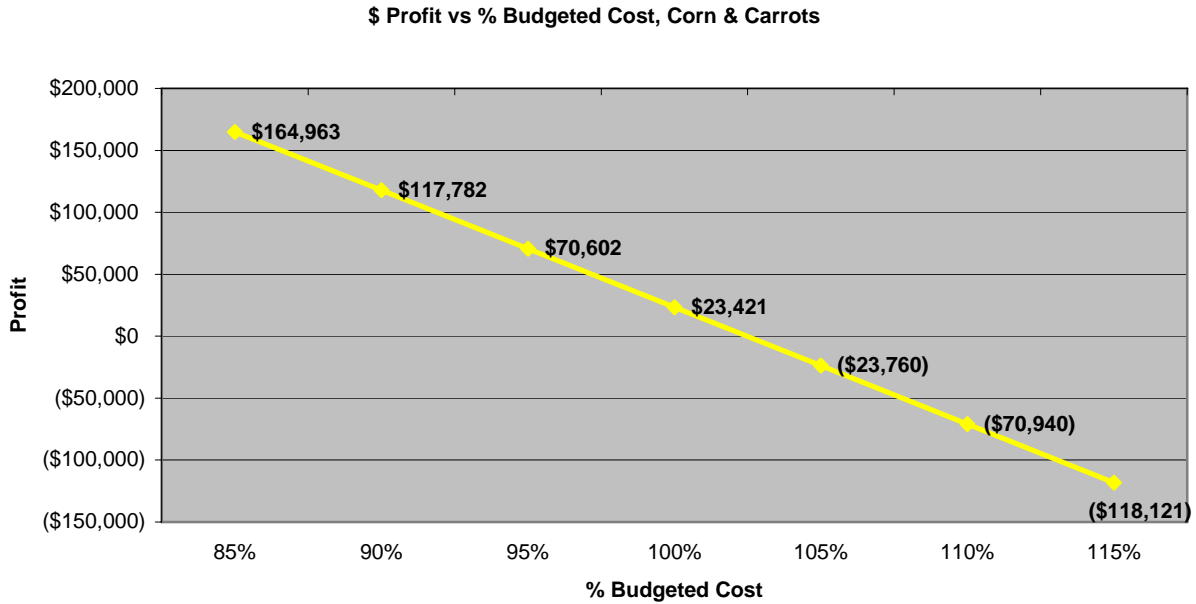
Graph 1 indicates a profit when the costs are increased up to 12% of the budgeted cost. This information is useful for decision planning and risk aversion. Many costs are subject to change, utilities for example can fluctuate periodically through the year depending on supply of their inputs. The Center for Agribusiness and Economic Development suggest a padding of 15-20% over budgeted cost to be safe. Often cost change after the start up of the business and the feasibility report.

Graph 2. Change in Profit versus Change in Budgeted Cost, Carrots.



Graph 2 indicates that until the costs are reduced 5% or more no profit exists.

Graph 3. Change in Profit versus Change in Budgeted Cost, Sweet corn & Carrots.

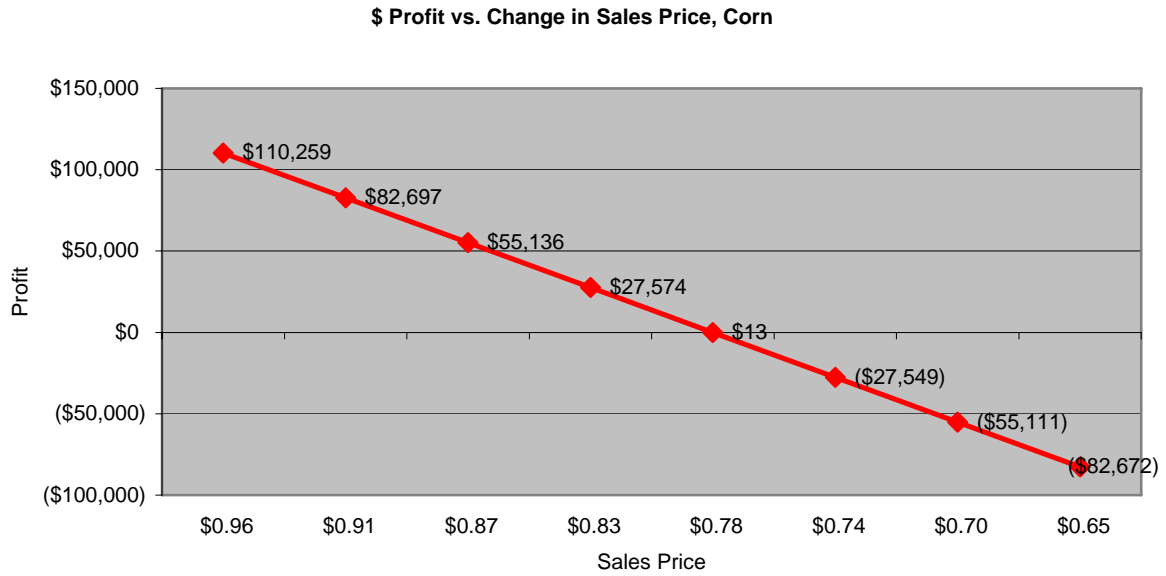


Graphs 1-3 indicate the relationship between budgeted cost and profit. The cost estimates are moved incrementally at 5% intervals to see the results on profitability and risk. As seen in the graphs, when costs increase by 15% none of the scenarios can create a profit.

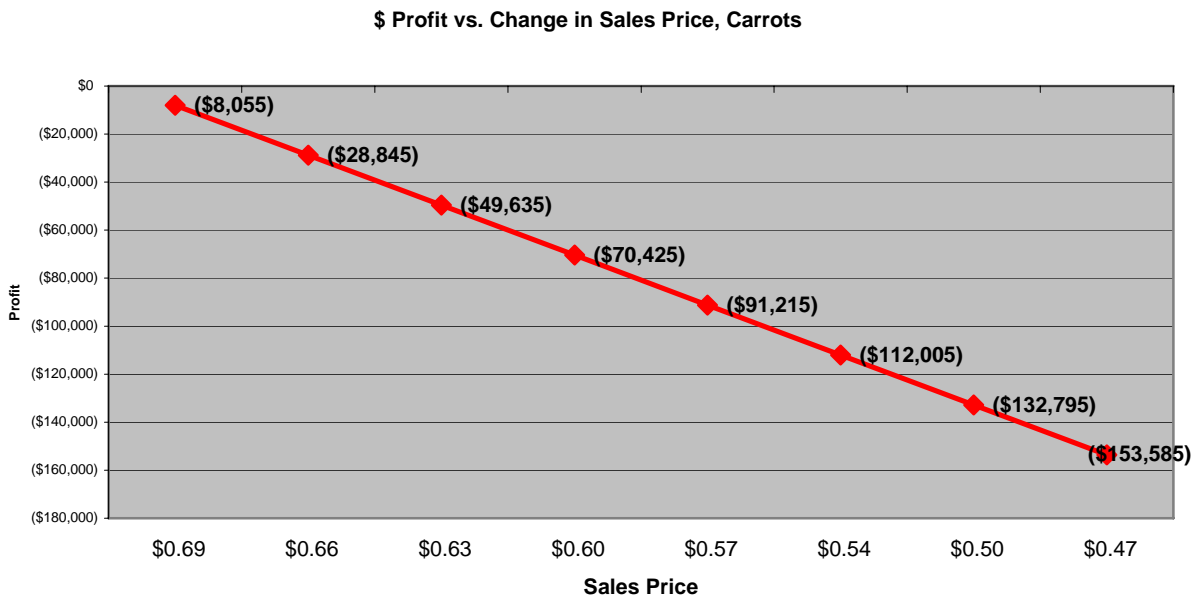
Profit versus Percent Over/Under Estimated Sales Price

This section indicates how the change in the sales price of packaged sweet corn and carrots affects the profitability of the facility. The obvious result is as prices decrease profits decrease. Again the first two graphs are as stand alone units.

Graph 4. Profit versus Over/Under Estimated Sales Price, Sweet corn.



Graph 5. Profit versus Over/Under Estimated Sales Price, Carrot.

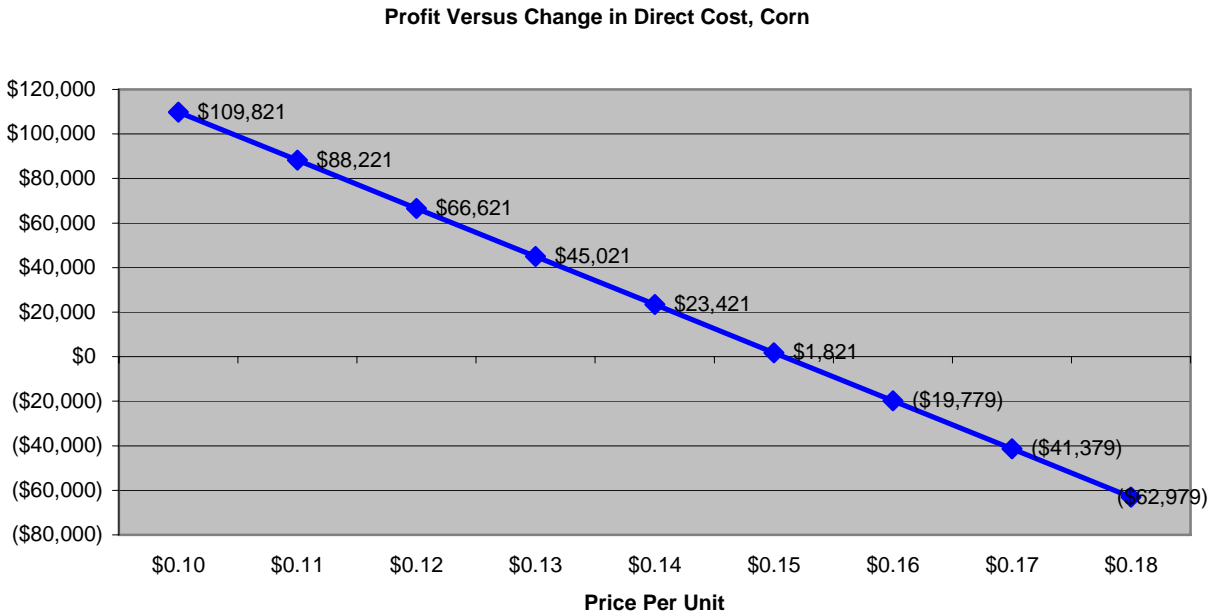


Profit Versus Change in Direct Cost (Farmgate Values)

Graphs 7-8 show how a change in the direct cost, or prices received by the producers selling the product into the facility affects profitability. Each prices was modified in 5% increments of the assumed prices received. The assumed prices came from the Farmgate publication, and producers

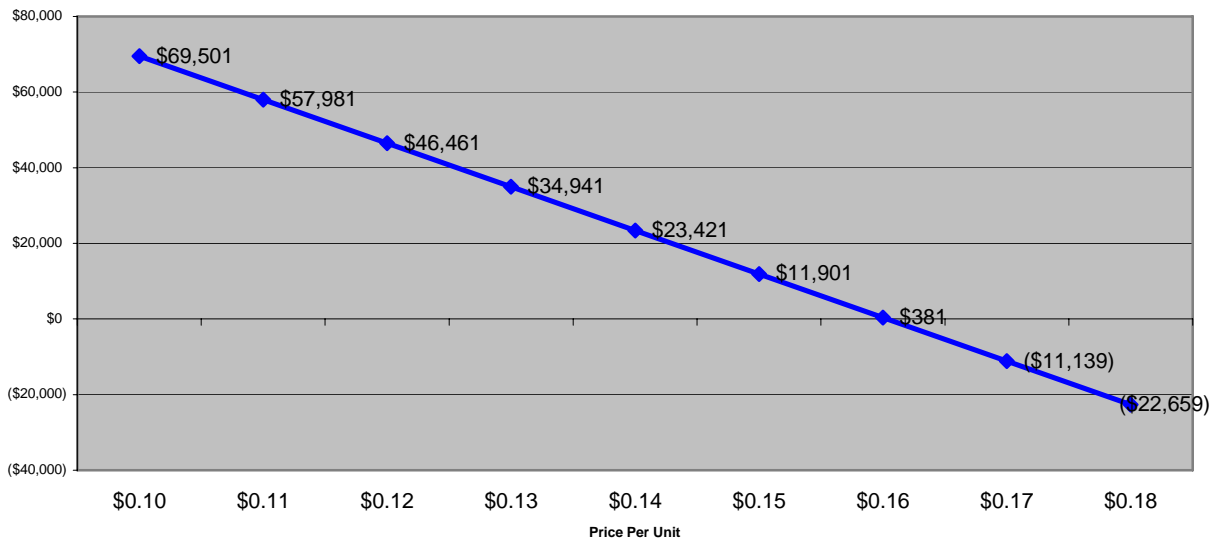
Vegetable	Direct Cost	Farmgate Price	Farmgate Units
3/8" Sliced Carrots	\$0.14	\$7.00	48lb
5" Corn Cobs	\$0.14	\$5.15	1 carton (42lbs)
Cut Corn	\$0.14	\$5.15	2 carton (42lbs)

Graph 7. Profit Versus Change in Farmgate Price, Corn



Graph 8. Profit Versus Change in Farmgate Price, Carrots

Profit Versus Change in Direct Cost, Carrots



Graphs 7-8 indicate the relationship between the input cost and the profits. The graphs attempt to measure the relative strength the direct input cost have on the profitability of the operation.

Financing, Operating, and Ownership Arrangements for an Individual Quick Freeze Processing Line

At present a marketing cooperative is the only financing and ownership method being considered for the fresh cut facility in Decatur County, Georgia. The main purpose of this facility is to increase the return to the vegetable producers through some means of value added technology. The major commodities, sweet corn and carrots, both produced and sold in the fresh cut market were investigated. Other commodities have little market share or are not produced in the area, such as cauliflower and broccoli.

Cooperatives

A special type of producer cooperative called a “New Generation Cooperative (NGC)” or a “closed cooperative” combines solution to both financing and operating questions. Producers would raise an initial portion of the packing equipment and working capital cost through stock or options on stock sales. Each share of stock would provide the right and obligation to market 100 pounds of vegetables (sweet corn or carrots) through the processing line. The remaining capital could be raised through debt financing. Operation of the processing line could remain with the producer/owner. The raw product could be priced to the producer through various arrangements including profit sharing of the final product. Any funds generated through an assessment per

pound marketed through the packing shed would be used to retire debt and would increase the producer's equity in the operation.

The recommended organizational structure would be an Fresh-cut facility cooperative formed as a value-added processing, closed cooperative of defined or selected membership whereby members invest through the purchase of shares of stock. These shares serve as a dual contract. Each producer has both the obligation and the right to deliver to the cooperative. Likewise, the cooperative is obligated to accept delivery, given quality standards are met. These delivery rights and obligations are transferable. Each member is still granted only one vote regardless of the number of shares owned.

The basic concept of this new type of cooperative is that producers capture profits that occur beyond the farm-gate by owning and controlling the local businesses that are positioned to earn those profits. The motivation of new generation cooperatives is more offensive than defensive—take control of your own destiny and be proactive rather than reactive. The main emphasis in cooperatives of this type has been on value-added processing, niche marketing, and producer/members viewing themselves as producing a finished food product rather than a raw commodity.

Producers tend to take greater interest in operations developed as a producer cooperative since they are also investors. The typical amount of member equity required is 50-60% of the initial equity needed for the project. This gives potential lenders the security of sufficient producer commitment. Banks have been the primary institutions that help in financing the remaining 40-50% needed by new cooperatives. Many commercial banks are also funding cooperatives. The USDA also has numerous financial programs that can assist cooperatives that meet certain criteria. Credit unions and the Farm Credit System have also actively lent funds to farmers to invest in new cooperatives. Other helpful support systems in the development of these new cooperatives include communities, regional economic development commissions, individual rural electric cooperatives, and university extension services.

New Generation Cooperatives retain many principles of traditional cooperatives such as democratic control through a one member, one vote policy; excess earnings are distributed among members as patronage refunds or dividends, and the board of directors is elected from the membership by the membership. The financing of NGCs allows for all, or almost all, net earnings to be returned to members at year-end since the members invest capital up-front. Future expansion is financed in the same way as original equity: members invest through the purchase of shares. In some instances, preferred shares may be offered to the community or general public. This allows communities to support the project while keeping control in the hands of the members. Some of the advantages of the New Generation Cooperatives include the ability of producers to react quickly to opportunities, the collective response of members to problems or opportunities, the creation of wealth within a community and local ownership keeps it there, stability for producers and efficiency for the packing shed through the restricted membership, consideration of the interests of the community through a diverse set of stakeholders, and commitment to the quality of the product by both the producers and processor.

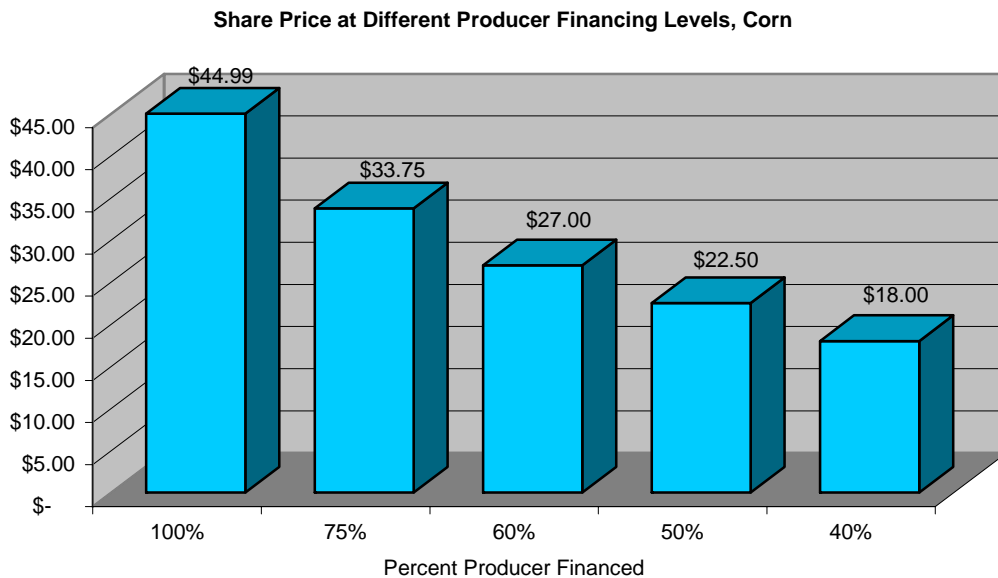
One of the keys to success of a New Generation Cooperative is producer commitment. The group of producers must be motivated, determined and committed. Other keys to success include public policy that supports cooperative formation, financial institutions willing to finance the cooperative, and consultant or facilitators to help producer groups through the aspects of the process. These keys to success seem to be evident in Georgia. Georgia Produce Growers must take ownership of the concept and drive the investigation into the possibility of operating a functional value added packing shed in Georgia.

The financing in terms of shares is calculated by taking the total cost divided by the total number of estimated units needed for a standard operating year. This will yield a share price for 100% financing by the producers. If the producers wish to lower their amount of equity the share prices will drop accordingly to the amount financed outside the operation.

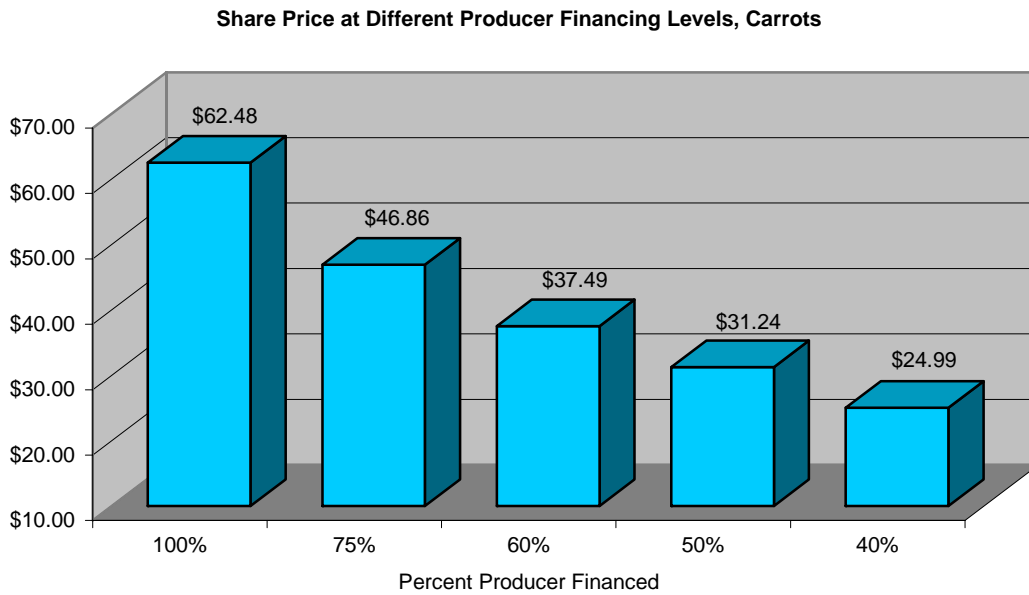
Share Price

The next chart indicates the estimated share price at various financing scenarios, 100% producer financing, 75% producer financing, 60% producer financing, 50% producer financing, and 40% producer financing.

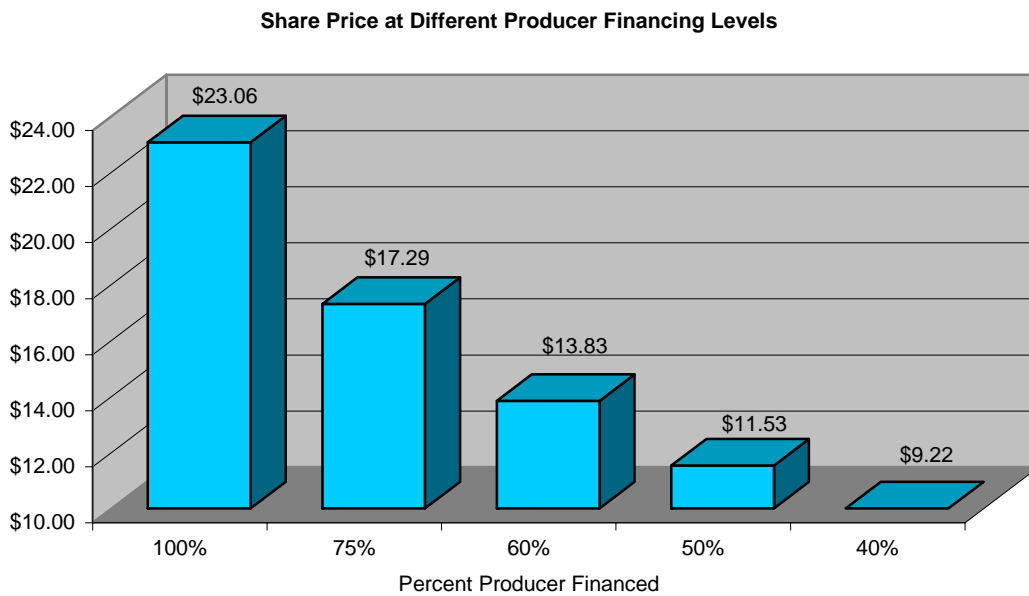
Graph 6. Share Prices at Various Financing Options, Sweet corn



Graph 8. Share Prices at Various Financing Options, Carrots



Graph 9. Share Prices at Various Financing Options, Sweet corn and Carrots.



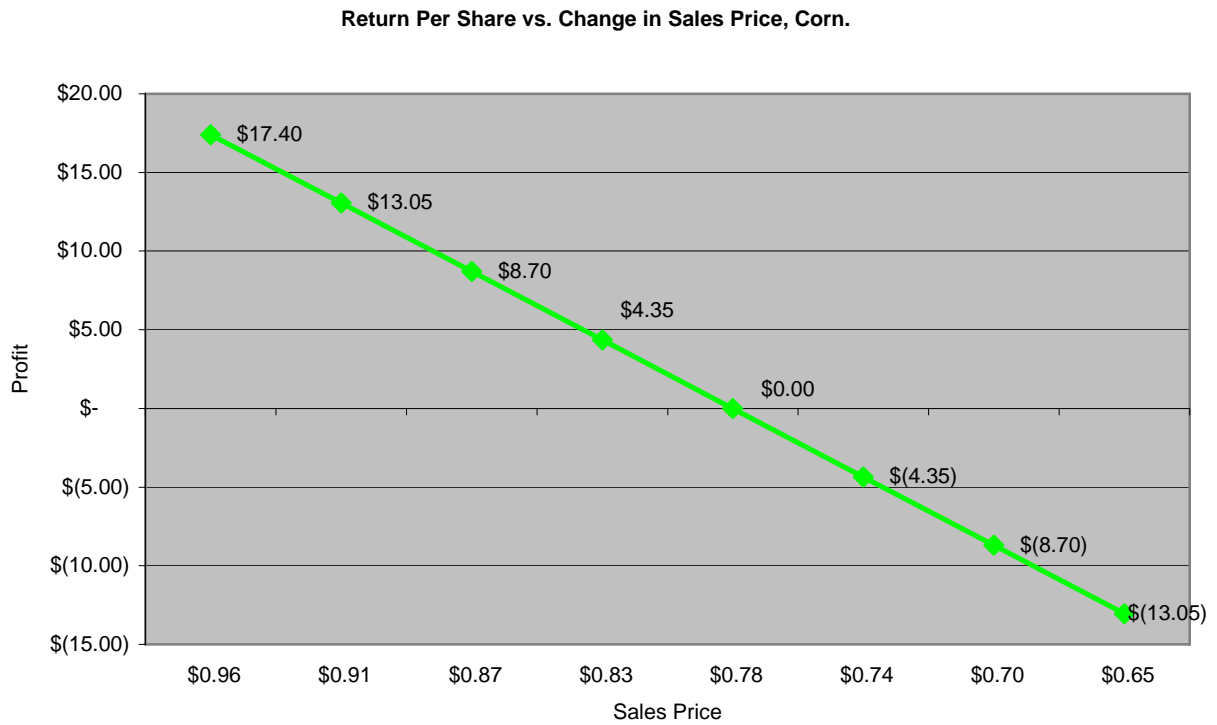
Another option for financing the plant is to contact local development authorities and submit grant requests to them and the state. Often development authorities will assist in part of

the grant writing or organizing of application materials to be submitted to larger state funds. Currently Georgia is taking submission for funds through the Authority One Georgia.

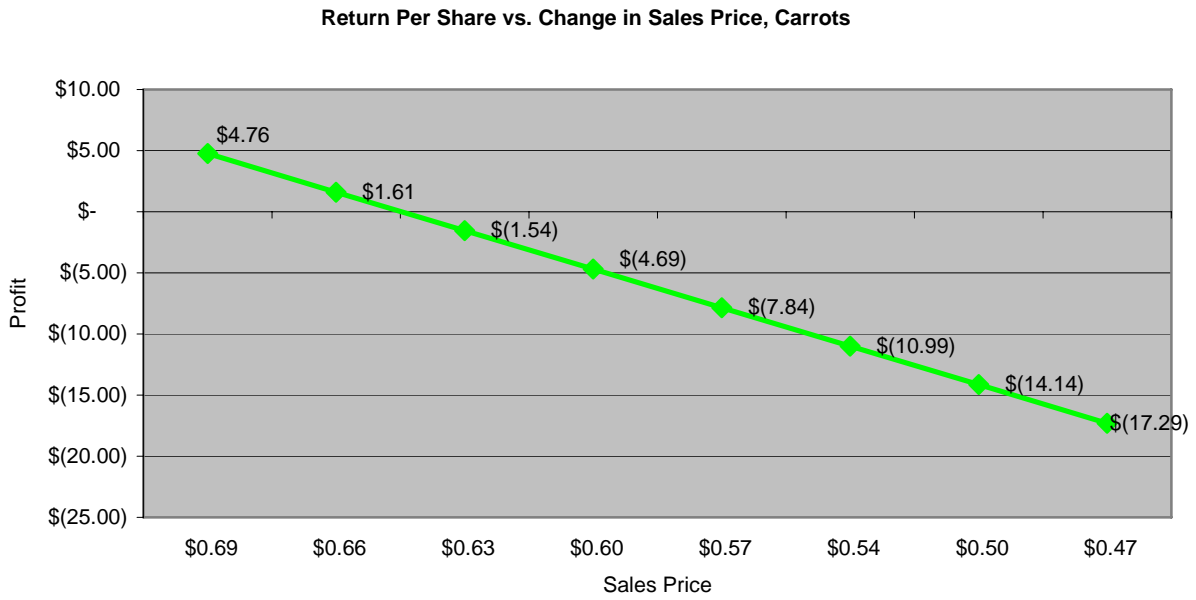
Return Per Share

Each share shall receive a portion of the profits. These dividends or profit sharing will occur either quarterly or annually based upon the recommendation of the board of directors. The following charts indicate returns per share for the three scenarios. If custom vegetable work or other products are produced the returns will need to be recalculated.

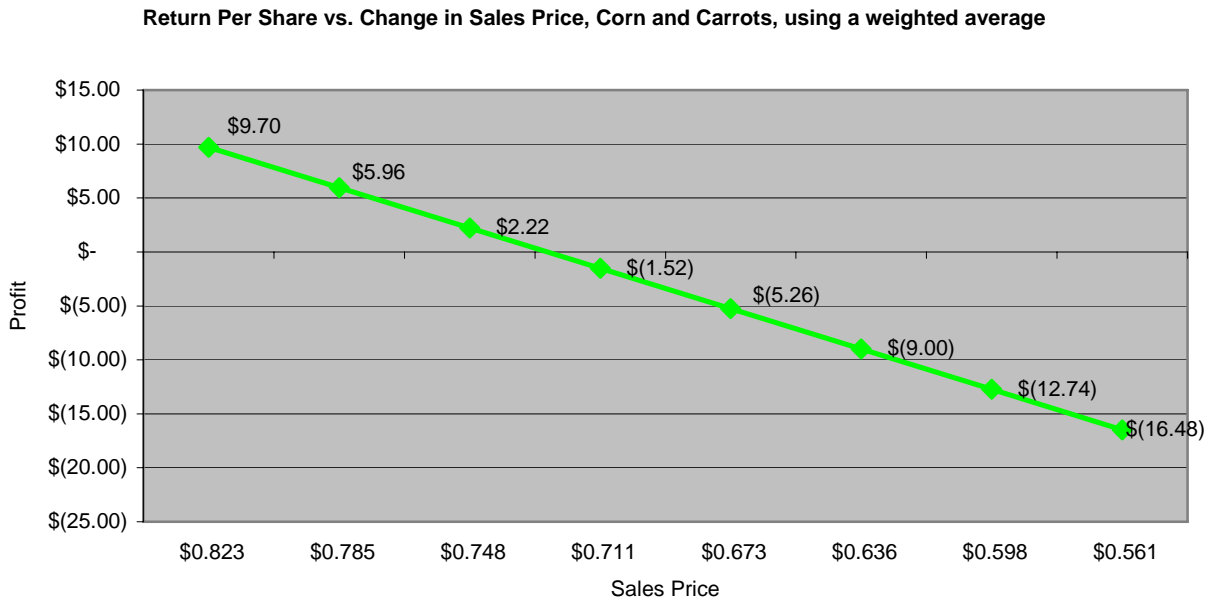
Graph 9. Returns Per Share at Various Sales Prices, Sweet corn.



Graph 10. Returns Per Share at Various Sales Prices, Carrots.



Graph 11. Returns Per Share at Various Sales Prices, Sweet corn and Carrots.



Graphs 5-7 indicate the returns per stock share at various sales price levels. When the sales price dips returns are diminished.

Impact Analysis

Impact analysis is a key component of any feasibility study. An impact analysis indicates the effect of a new venture on the economy. Building and implementing a fresh-cut packing facility in Decatur County, Georgia will impact the economy in several ways. The new plant will generate output as it begins selling packaged vegetables. These sales will, in turn, generate additional sales as the plant purchases inputs. The suppliers to the plant will increase the purchase of their inputs, thus increasing demand for those items. These increased sales will ripple through the economy. An input-output model will capture and quantify these effects.

The input-output model IMPLAN (Impact Analysis for Planning, Minnesota IMPLAN Group) was utilized for this project. IMPLAN predicts the effects of a new venture on output (sales), employment, and tax revenue. IMPLAN models can be constructed for a state, a region, or a county. Input-output models work by separating the economy into its various sectors, such as agriculture, construction, manufacturing, and so forth. A direct change in production, such as the construction of a new packaging line, can be entered into the model for a certain sector. IMPLAN then measures the changes in the other sectors that occur because of the initial change. IMPLAN captures the relationship between industries in the region and shows how the change in one industry relates to the others. One limitation to this model is the backward nature in which it calculates these figures. However, it is estimated this limitation is of minor significance to the overall model. Two models were run for this feasibility study: the hydro washing unit and the hand pack operation.

Estimating the potential impact of this particular project presents an interesting challenge. In this case, sweet corn and carrots are already being harvested and sold. Adding the washing, cooling, and packing facility will directly increase revenue. This is because the vegetables will be marketed differently as they add value by shucking or peeling. The benefits of this packing line exist in other areas, particularly in marketing. Thus, this section will use IMPLAN to examine the current impact of vegetable production and to examine the impact of the packing line. However, when interpreting the impacts of the fresh-cut packing line, one must remember the economic activity may not be completely new activity since vegetable sales are already occurring. New employment will be evident as the packing line will have new jobs.

Vegetable production has a positive impact on sales, employment, and tax revenues in Georgia. The associated employment is 13 jobs. This may be slight higher, however, as it does not fully account for part-time harvest labor. These are the direct effects shown in Table 3. The production of fresh cut sweet corn and carrots, in turn, generates another \$426,563 of activity in Georgia. This brings the total value of packaged vegetables to \$967,032 million. The production of vegetables also adds an additional 5 jobs to Georgia's economy, bringing the total employment attributable to collards to 18. State and local government non-education tax revenue is also affected by packaging the vegetables. Roughly \$67,000 of these tax revenues are due to collard production.

	Direct	Indirect	Total
Output (Sales)	\$967,032	\$426,563	\$1,674,293
Employment	13	5	18
Tax Revenue	NA	NA	\$67,091

Conclusion

Assessing the financial aspect of the fresh-cut packaging facility risk is inevitable. The three different scenarios showed that packaging for a portion of the year is not economically feasible. Resources need to be utilized at 100% capacity to be feasibility. A slight profit margin is achievable but this depends on selling all the products produced. Gaining that portion of the market takes times and usually is not done over night. This project will require countless hours of dedication and devotion from the producers to make it attainable. Alternatives to using the facility in the remaining months when limited amounts of sweet corn and carrots are available needs to be pursued. Fresh-cut facilities visited by the researchers also co-pack onions, potatoes, bell peppers, and fruit throughout the year. Basing this project solely on vegetables currently produced in the area will not be feasible.

Table 4. Fresh Cut Grocery Store Data

Product	Size (lbs)	Units Sold	Total Retail Sales	Total Pounds	\$/lb	Per Unit Retail Price	Wholesale Price/Lb
Carrots, baby peeled (1 lb)	1	1,277,824	\$2,257,533	1,293,901	\$1.74	\$1.75	\$ 1.05
Carrots, mini peeled (2 lbs)	2	103,066	\$1,524,934	558,632	\$2.73	\$2.73	\$ 1.64
Yellow corn tray, 4 pack		162,284	\$434,340	162,284	\$2.68	\$2.68	
White corn tray, 4 pack		199,657	\$532,430	199,657	\$2.67	\$2.70	
Bagged collard greens (2lbs)	2	142,436	\$487,789	284,872	\$1.71	\$3.42	\$ 1.03
Broccoli, Shrink Wrapped 14 ct		243,592	\$463,454	243,592	\$1.90	\$2.03	
Carrots, bagged (5 lbs)	5	93,394	\$250,888	466,970	\$0.54	\$2.69	\$ 0.32
Carrots, bagged (2 lbs)	2	206,168	\$243,999	412,336	\$0.59	\$1.18	\$ 0.36
Carrots, bagged (1 lb)	1	330,338	\$227,103	330,338	\$0.69	\$1.45	\$ 0.41
Turnip Greens, bagged (1 lbs)	1	69,190	\$178,131	69,190	\$2.57	\$2.55	\$ 1.54
Carrots, mini peeled (5 lbs)	5	21,982	\$153,384	109,910	\$1.40	\$6.98	\$ 0.84
Carrots, mini peeled (6- 3.oz baggs)	1.125	38,172	\$96,585	42,944	\$2.25	\$2.31	\$ 1.35
Broccoli Florets (1lb)	1	28,479	\$67,480	28,479	\$2.37	\$1.51	\$ 1.42
Radish, red (1lb)	1	45,509	\$67,383	45,509	\$1.48	\$1.51	\$ 0.89
Corn, bi color 4 pack tray		24,557	\$61,589	24,557	\$2.51	\$2.54	
Mustard Greens (1lb)	1	19,880	\$50,539	19,880	\$2.54	\$2.54	\$ 1.53
Carrots, bag (2 lbs)	2	38,550	\$45,718	77,100	\$0.59	\$1.19	\$ 0.36
Carrots, bag (5 lbs)	5	13,582	\$36,533	67,910	\$0.54	\$2.69	\$ 0.32
Caulifolour Florets (3 lbs)	3	8,098	\$20,856	24,294	\$0.86	\$2.58	\$ 0.52

As seen above, another issue is the current sales by supermarkets in Georgia that amounted to approximately 199,000 units of packaged sweet corn being sold in 2001. However, the proposed facility would be creating over 360,000 units. Markets outside of Georgia and even the Southeast would need to be entered in order to sell all the sweet corn package by the facility.

The fresh-cut market in Georgia is very large, however, it is dominated by packaged pre-cut lettuce products. The proposed facility needs to create market opportunities. Co-packaging for existing vegetable processors and food retailers, developing a new and innovative way to package popular vegetables may assist the packing facility. The market is moving towards convenience products that package bulk items. This packaging provides convenience to consumers and moves more products for retailers as consumers generally buy more products when it is pre-packaged rather than being sold as bulk. The food service sector may offer a significant opportunity but these establishments generally want packaged bulk items.

The Center for Agribusiness & Economic Development



The Center for Agribusiness and Economic Development is a unit of the College of Agricultural and Environmental Sciences of the University of Georgia, combining the missions of research and extension. The Center has among its objectives:

To provide feasibility and other short term studies for current or potential Georgia agribusiness firms and/or emerging food and fiber industries.

To provide agricultural, natural resource, and demographic data for private and public decision makers.

To find out more, visit our Web site at: <http://www.caed.uga.edu>

Or contact:

John McKissick, Director
Center for Agribusiness and Economic Development
Lumpkin House
The University of Georgia
Athens, Georgia 30602-7509
Phone (706)542-0760
caed@agecon.uga.edu

The University of Georgia and Fort Valley State University, and the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability.

An equal opportunity/affirmative action organization committed to a diverse work force.

FR-02-02

January 2002

Issued in furtherance of Cooperation Extension Acts of May 8 and June 30, 1914, the University of Georgia College of Agricultural and Environmental Sciences, and the U.S. Department of Agriculture cooperating.

J. Scott Angle, Dean and Director