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Vertical Integration in Produce Markets: A Colorado Cooperative's Strategic Response to Change

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An evolving produce industry has placed vegetable growers in northern Colorado at a competitive disadvantage. The Colorado producers' strategic response is to form a value-added, cold storage processing cooperative in the hopes of establishing a better position for marketing their vegetables on a year-round basis. This case study discusses the results of both a market demand and processing feasibility study conducted for these vegetable growers.

Key Words: cooperative, feasibility study, vegetable processing plant

Without question, the U.S. fruit and vegetable industries have undergone dramatic structural change in recent years. Consumers are a leading driver of change, as they purchase greater quantities of produce and opt for value-added products. Indeed, per capita consumption of fruits and vegetables grew 6% between 1987 and 1995, and 8% between 1995 and 2000. Likewise, branded products' share of produce sales has increased—branded products have gone from a 7% share in 1987 to a 19% share in 1997, while the share of fresh-cut produce and packaged salads grew from 1% to 15% over the same period (Dimitri, Tegene, and Kaufman, 2003).

Changing consumer preferences have created a more demanding produce food industry whose production and marketing methods are evolving to meet customers' needs. As an example, consumers increasingly demand packaged vegetables, and the equipment used to prepare these vegetables requires a significant capital investment which ultimately results in a barrier to entry (Calvin and Cook, 2001). Moreover, contracts are now commonplace between buyers and sellers, specifying particular market practices such as third-party certification, restocking, and data sharing (Kaufman et al., 2000). Increased coordination is further evidence of a more demanding food supply chain.

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The food supply chain is also becoming more consolidated as fewer firms control the processing and distribution of fruits and vegetables. In 1999, the four largest food retailers' share of total grocery store sales was 27%, an increase from 18% in 1987 [U.S. Department of Agriculture/Economic Research Service (USDA/ERS), 2001b]. Suppliers are combining, too, as evidenced by grocery-oriented wholesalers who undertook 32 mergers and acquisitions in 1999, closely followed by food service wholesalers who completed 31 mergers. Shippers likewise have been consolidating; the top two packaged salad firms accounted for 76% of the total fresh-cut salad sales in 1999 (USDA/ERS, 2001b).

Changing consumer preferences, increased coordination, and industry consolidation have placed smaller, seasonal vegetable producers at a competitive disadvantage relative to larger, year-round producers. Specifically, smaller producers cannot capture scale efficiencies at their existing production levels; small producers lack market access because they cannot assure year-round supply of large vegetable quantities; and small producers do not have a countervailing market presence to attract vegetable buyers and compete with larger producers.

The case study presented in this paper focuses on a group of Colorado vegetable producers faced with the challenges of a changing food system. To offset what they believed to be their competitive disadvantage, the producers have made a strategic choice to form a value-added cooperative in an effort to assure market access and generate economies of scale. The goals of the cooperative are two-fold: to explore the potential of a niche market for locally grown (Colorado) vegetables and to build a cold storage processing facility that would extend the marketing of its raw vegetable product.

The remainder of the paper is organized into two sections. The first section reports the results of a market study examining the demand for fresh and processed produce in Colorado. The marketing study is followed by a feasibility analysis of the cooperative's vertical integration strategy to build a vegetable processing facility. Recommendations and suggestions for future research close the case study.

Market Analysis of the Colorado Cooperative

The members of the Colorado vegetable cooperative in this study have traditionally marketed a variety of vegetables including spinach, summer and winter squash, broccoli, corn, onions, and carrots. The cooperative's competitors in these markets are growers in more moderate climates who are able to supply vegetables year-round. Major competitors include California growers who produce 61% of all fresh vegetables in the United States, along with Florida (24%), and Arizona (5%). In particular, California accounts for the majority of fall-season vegetables and melon acreage (USDA/ERS, 2001a).

Colorado's seasonal production puts its produce at a comparative disadvantage, as brokers/dealers prefer to work with growers who can provide them with a consistent and year-round supply of produce. A potential strategic response to the disadvantage is to create a market niche for locally grown, fresh vegetables. To implement

the strategy effectively, the cooperative needs to better understand its customers. Consequently, a market research study was conducted and includes surveys of consumers, growers, wholesalers/distributors, brokers, restaurant managers, and other food service industry components such as casinos, government institutions, grocery stores, and larger corporations—all of whom are potential customers of the vegetable cooperative.¹

The End Consumer Survey Results

The Colorado growers knew they had a comparative advantage in the production of spinach, sweet corn, winter and summer squash, and broccoli; however, this advantage is of little value if it does not match consumers' preferences. Thus, the growers first needed information about what types of vegetables consumers preferred: frozen, fresh, canned, or some combination of these three types. A consumer survey was developed to elicit consumer preferences and was administered during the spring of 2001. Section I of the consumer survey focused on general consumption patterns and vegetable attributes that consumers found important, including the premium these consumers were willing to pay for these attributes. Section II asked questions about biotechnology and consumers' general attitudes associated with genetically modified (GM) foods. The last section of the survey requested demographic information, from which a target audience could be developed.

University students conducted the surveys in Colorado supermarkets located in Fort Collins, Greeley, Fort Morgan, Denver (front range of Colorado), Alamosa, and Montrose. A total of 505 consumers were surveyed. These locations were chosen because they represent both a large percentage of the population and a diverse group living in various sections of the state. Consumers were randomly solicited in the produce section of the stores and were asked for their voluntary participation in the survey. In order to collect a representative sample, the survey was administered at various times during the weekdays, evenings, and again on the weekends.

As summarized in table 1, 71.3% of the respondents are female, with a mean age of about 50 years. The mean education level reveals that respondents have "some" years of college, with almost half earning a bachelors degree or higher. This compares with a 40% level for Colorado in general, based on the 2000 Colorado census (Colorado Department of Agriculture, 2000). Twenty percent of the respondents have at least one child in their household and 22% have two. Finally, among those who responded to the income question, 26% earned between \$30,000–\$50,000; 21% earned between \$50,000–\$75,000, and 19% earned over \$70,000. These values are higher than the 2000 Colorado census mean values, but income and education levels along the front range of Colorado (Fort Collins to Colorado Springs) are higher than those of the state in general (Colorado Department of Agriculture, 2000). The front

¹ Results from all of these various groups are available from the authors on request. However, only relevant survey results are presented in this paper.

Table 1. Consumer Interview: Sociodemographic Data (N = 505)

Variable	Description	Mean	Standard Deviation
Gender	0 = Male, 1 = Female	0.713	0.452
Presence of Children in the Household	0 = No children under 18 years old living in the household; 1 = otherwise	0.153	0.360
Income	Household's income level: 1 = < \$25,000 2 = \$25,000–\$49,999 3 = \$50,000–\$74,999 4 = \$75,000–\$100,000 5 = > \$100,000	3.523	1.488
Age	Age of consumer	50.150	16.662
Education Level	Highest level of education completed: 1 = Non-graduate 2 = High School 3 = Some College 4 = Associate Degree 5 = Bachelors Degree 6 = Masters Degree 7 = Doctorate Degree	3.412	1.177
Years Spent in Colorado	Total years	27.502	18.000

Source: Loureiro and Hine (2002).

range has been targeted by the vegetable producers because of its relative concentration of higher income, and more highly educated consumers who often have a greater willingness to pay for locally grown products.

Consumers have a strong preference for fresh vegetables all year round. In general, 94% of the surveyed consumers preferred fresh to processed (frozen or canned) items. The survey produced some additional interesting results. Summer and winter squash (a preferred production crop by growers) were not at all popular choices among consumers, garnering less than 1% of the total market share for fresh vegetables. Additionally, the demand for sweet corn (another favorite among the growers) proved to be extremely seasonal and not highly preferred as a processed product. Finally, although spinach was more popular than either winter or summer squash, it did not rank high among fresh vegetable choices (Loureiro and Hine, 2002).

In order to study consumer preferences, we examined vegetable attributes that were highly valued by the consumer. Consumers were asked their willingness to pay for a pound of Colorado-grown, organic, and GMO-free vegetables. Willingness to pay was elicited with a payment card method whose question was posed as follows:

Assuming fresh or frozen vegetables were priced at \$1.00 per pound at your grocery store, how much of a premium per pound (how many more cents per pound), if any, would you be willing to pay for them with each of the following characteristics?

Characteristic	Cents per Pound					
	None	< 5¢	5¢–10¢	11¢–15¢	16¢–20¢	> 20¢
Genetically Modified Free	None	< 5¢	5¢–10¢	11¢–15¢	16¢–20¢	> 20¢
Organically Grown	None	< 5¢	5¢–10¢	11¢–15¢	16¢–20¢	> 20¢
Colorado Grown	None	< 5¢	5¢–10¢	11¢–15¢	16¢–20¢	> 20¢

Payment card instruments are extensively used in the contingent valuation literature to elicit willingness to pay from respondents. We acknowledge that a certain degree of anchoring bias may exist with this method because the respondent may observe the different payment levels before answering the valuation question. Anchoring bias is also a common problem in other questioning schemes such as the dichotomous choice questions with follow-ups. Previous literature compares the performance of different elicitation methods, including open-ended questions, payment card, and double-bounded dichotomous choice questions. Reaves, Kramer, and Holmes (1999) concluded that the payment card format exhibits desirable properties relative to the other two formats.

Among the different elicitation formats, we employed a payment card similar to one successfully used in a previous study by Loureiro and Hine (2002). Furthermore, the construction of the intervals in this payment card elicitation question (and particularly the design of the brackets) was done after a pre-test of the current survey. In this pre-test, open-ended questions were used to ask the maximum amount consumers were willing to pay for the different attributes in different products. In the pre-test, most of the survey participants indicated their willingness to pay was between 5%–10% of the original price for any of the mentioned attributes. Thus, in our sample, consumers' average willingness to pay is well below observed retail prices for organic vegetables, which may be twice the observed price of conventionally produced vegetables.

Table 2 summarizes the results of the payment card question. As indicated by the first row of the table, a large percentage of individuals indicate they are unwilling to pay any premium for any of the mentioned attributes. Conversely, between 3.78% and 13.2% of respondents are willing to pay a premium of greater than 20 cents for these attributes (last row of table 2). The distribution of responses thus suggests the payment card method worked reasonably well in this case.

Surprisingly, Colorado consumers were willing to pay a higher premium for a Colorado-grown vegetable than for an organic or GMO-free vegetable. Local origin was the attribute with the highest acceptance rating and carried the highest associated premium. Seventy-three percent of the surveyed consumers said that origin of production was important to them. Another interesting finding was that 80% of the consumers reported they would be more prone to buy vegetables which were labeled as "Colorado-grown," and 75% of the consumers were willing to pay a premium to

Table 2. Summary of Results of the Payment Card Question: Percentage of Consumers Willing to Pay for Vegetable Attributes (N = 505)

WTP Amount	Vegetable Attribute			
	GMO Free	Organically Grown	Colorado Grown	Pre-Cut/Packaged
	<!!!!!!!!!!!!!!!!!!!!!!!!!!!! (%) !!!!!!!!!!!!!!!!!!!!!!!!!!!!! >			
0¢	29.22	23.98	14.67	26.20
< 5¢	36.27	29.26	17.83	29.47
5¢–10¢	12.09	17.75	25.26	20.15
11¢–15¢	9.07	10.79	19.41	15.11
16¢–20¢	4.28	7.19	9.48	5.29
> 20¢	9.07	11.03	13.20	3.78

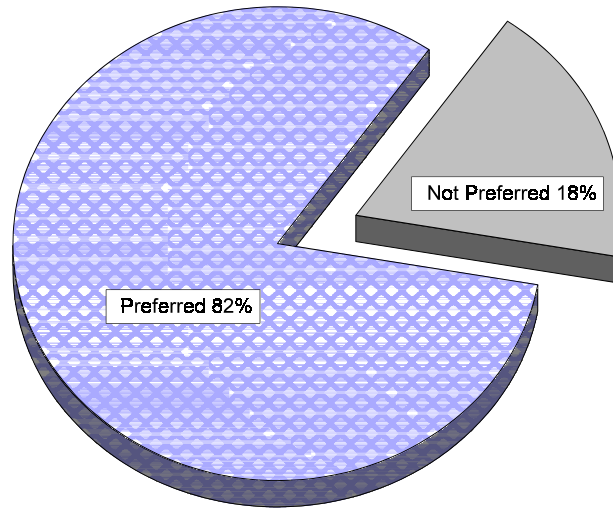
obtain “Colorado-grown” products, as illustrated in figures 1 and 2 (Loureiro and Hine, 2002). These findings are consistent with results of other studies—for example, Loureiro, McCluskey, and Mittelhammer (2003), who found through empirical testing that consumers who state they would pay a premium for a product (apples) are more likely to actually purchase the product.

The survey results suggest that developing a “Colorado-grown” market niche may be a successful strategy. Local origin, or origin combined with certain production techniques, appears to be a niche for many successful products. As examples of market niches, Bastian et al. (1999) studied consumer interest in the diversity of products available from local draft brewers in the Rocky Mountain region; and Aquino and Falk (2001) analyzed the niche market for “wolf-friendly” beef in New Mexico.

The Middlemen Survey Results: Distributors, Wholesalers, Brokers, and Food Service Groups

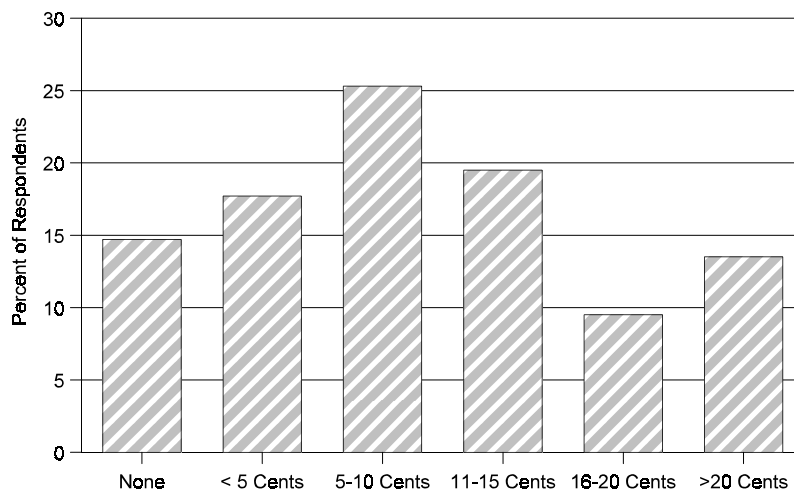
While consumers are the ultimate end users of vegetables, middlemen are the primary customers of the value-added cooperative. The middlemen were identified by Standard Industrial Classification (SIC) code, and a list was compiled for the nation as a whole. The middlemen were contacted via telephone and were then asked a specific list of questions. There was no prearranged selection because the number of middlemen in this industry is relatively few; thus, an attempt was made to reach each of them. Twenty-three surveys were completed from 180 calls.

The surveys were organized to verify what was generally considered to be fact; i.e., middlemen prefer buying from fewer suppliers in order to minimize their costs. These participants included buyers who consistently resell the producers’ vegetables to major restaurant chains and grocery stores throughout the region and nationally. As summarized in table 3, the distributors and brokers sought a high-quality product, noting that freshness was, in particular, an important factor determining value.



Source: Consumer Survey

Figure 1. Preferences for Colorado-grown vegetables



Source: Consumer Survey

Figure 2. Willingness to pay for Colorado-grown vegetables

Table 3. Summary Results of Middlemen Survey (N = 23)

— SURVEY RESULT —

- Overall, less than 10% of the distributors' business is represented in Colorado, with the exception of two buyers.

- When asked how the company made its purchasing decision, the number one answer was "quality," followed by "price." Past track record, time of year, and long-term relationships were also factors in the purchasing decision.
- Regarding long-term contracts: some long-term contracts (negotiated annually) were in place (two- to three-year contracts), but most did not depend on long-term contracts. Those contracts in place had criteria for volume and/or grade.
- The top five most important factors in selecting fresh vegetables were:
 - < Quality (freshness)
 - < Price
 - < Availability
 - < Consistency
 - < Variety
- Colorado did not fare well when the distributors were asked about the overall vegetable purchases made from Colorado and their opinion of Colorado vegetables relative to others, such as California or Florida. Limited growing season was the most frequent reason as to why these distributors did not rely more heavily on Colorado vegetables. Distributors' opinions regarding the Colorado vegetables ranged from "still a bit behind California," to "Colorado is making great strides," to "Colorado does a really good job on most items."
- Distributors indicated they would be motivated to increase their purchases of vegetables from Colorado if:
 - < There were a greater consumer demand for Colorado vegetables.
 - < The customer dictated more quality and Colorado could deliver it.
 - < The customer requested Colorado-grown vegetables.
 - < The vegetables fit a niche for consumer demand.
- Only longer growing seasons, less weather problems, and more variety could make production better.
- Most distribution locations have the flexibility to make decisions on products carried; however, nearly half have central offices that make the purchase decisions.
- Colorado-based restaurants tended to use long-term contracts the most. There is also evidence of strong loyalties to the current distributor without the need or apparent interest in bringing on additional distributors.

Source: Hine, Loureiro, and Meyer (2001).

Quality was followed closely by concerns about the product's price, product availability, consistency of delivery, and variety of offerings. The middlemen were also concerned with the following problem: If these brokers purchase Colorado-grown products in the summer, their suppliers from California and other states could conceivably change to a new buyer—one who would purchase their products all year round. The size of these seller groups is large enough such that in many situations they can dictate to the middlemen the terms of product delivery.

In summary, the consumer survey results indicate a market opportunity for developing a "Colorado-grown" niche market. Middlemen are only willing to expand purchases of this produce if it is of high quality and if supplies are available year round. Noting the results from the market research, and given the large amount of produce needing to be marketed, the value-added cooperative decided it should also examine the feasibility of a cold storage, vegetable-processing facility and the development of its own year-round farmer's market. The group recognized that this was a first step in extending the sale of products, but given the amount of produce to be marketed, more avenues for marketing would need to be explored. It was recommended the cooperative hire both a marketing and a sales person to help develop the market potential identified in the study. The study's overall recommendations are discussed more fully at the end of the case.

Feasibility Study: Vertical Integration into Cold Storage

The front range Colorado vegetable producers (approximately 21) are responding to a number of incentives in their effort to vertically integrate into a cold storage processing facility. Research into vertical integration has been discussed in the early industrial organization literature (e.g., Jewkes, 1930) and constitutes a significant body of work. Incentives include the desire to achieve greater technical efficiencies (Perry, 1989); a need to reduce uncertainty in both the supply and quality of inputs (e.g., Carlton, 1979; Hennessy, 1996); an effort to reduce transaction costs (e.g., Frank and Henderson, 1992); and a means of eliminating asymmetrical information, as an alternative to incomplete contracts, and as a means to capture rents associated with imperfect competition (e.g., Perry, 1989; Azzam, 1996). In the case of Colorado's vegetable producers, market access might be gained by vertically integrating into processing, because the value-added cooperative can provide a larger, year-round supply of vegetables to buyers. In addition, producers may be able to capture scale efficiencies in production-processing to capture additional rents. Ultimately, the additional profits from vertical integration in the value-added cooperative must be balanced with costs, and the following analysis was performed to investigate the financial feasibility of the investment.

The study examines the feasibility of processing fresh vegetables through a cold storage facility to offer the fresh products desired by the consumer, and/or provide frozen vegetables guaranteeing buyers a year-round supply of vegetables. The feasibility analysis includes the direct investment in the cold storage facility (see table 4 for the facility details) as well as links to vegetable production operations of

Table 4. Cold Storage Facility Details

Vegetables Chosen	(1) Spinach, (2) Winter Squash, (3) Summer Squash
Buildings	Two buildings are included in the study: <ul style="list-style-type: none"> < The main processing building houses the processing plant, employee restrooms, lunchroom, and office space on the second floor. This building has 45,000 square feet including the second floor office space. < The second building is a dry goods warehouse for the storage of winter squash for processing during the late fall months.
Processing Line	The warehouse is 120 feet by 50 feet (6,000 square feet). <ul style="list-style-type: none"> < A processing line for spinach and a processing line for squash (both summer and winter) are included. < The projections were modified to use a single freezing tunnel and associated packaging machinery. < Fifty percent of the optional machinery identified is included.
Office Employees	The base model includes salaries of: <ul style="list-style-type: none"> < \$72,000/year for the general manager < \$60,000/year for the marketing and production managers < \$40,000/year for the accounting/bookkeeping person < \$30,000/year for the secretary/receptionist
Labor	Seasonal labor is used at \$8/hour. A higher wage may be required to attract the necessary individuals.
Location	The facility should be situated near the center of the production area—Brighton to Wellington (south to north) and Berthoud to Eaton (west to east).

the cooperative's members. The feasibility analysis tool consists of a series of linked spreadsheets (as illustrated in figure 3) and includes investment costs, production information, enterprise budgets, income statements, cash flows, amortization schedules, and price/yield data. The value of the spreadsheet and its templates was that cooperative members could easily change production numbers, crops, and prices (for example) in order to arrive at a final investment value. The feasibility study helped them to understand the importance of having reliable information available for decision making, and to recognize how the proper use of technology in the form of a spreadsheet (to which almost all participants had access) could provide them with a base from which to make more informed decisions.

Combining Knowledge Management with Production Decisions

Before starting the feasibility analysis, cooperative members were reminded that even though a project might be financially feasible, the attitudes, information, and

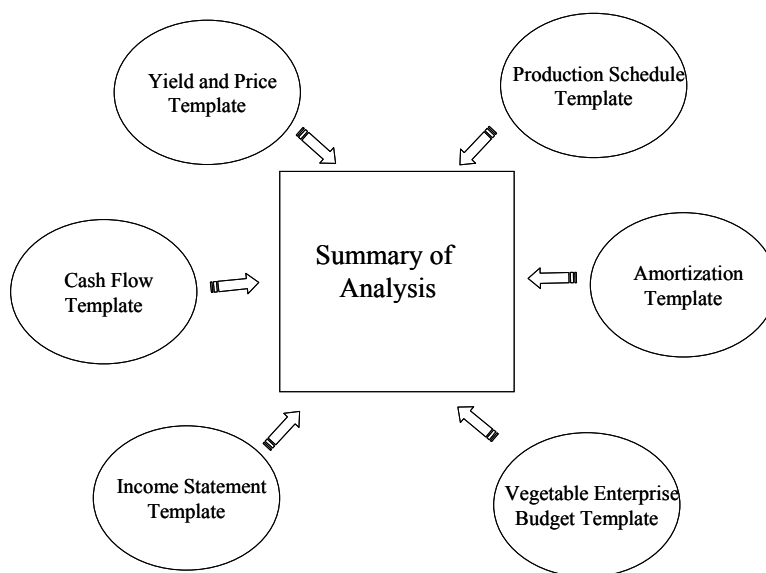


Figure 3. Vertical integration investment analysis spreadsheet

knowledge of individual producers must also be coordinated to make the cooperative successful. None of this could occur without a change in attitude and management on the part of individual producers.

Producers tend to be very proprietary about their businesses' information, yet the basic concepts of knowledge management include the notions of "sharing" and not "hoarding" information (Kluge, Stein, and Licht, 2001). Communication needs to be open, and information needs to flow throughout the organization, cultivating ideas and enabling the business to stay abreast of new techniques and customer demands. Although the use of technology in the form of a spreadsheet was important to the producers, it was also important for them to understand that good management, while driven by technology, is not a technology in and of itself (Koulopoulos and Frappaolo, 1999). The feasibility study's goal was to provide the cooperative's members with some new sources of information, but ultimately, the producer-members needed to come together as a group and form a management team based on trust, openness, and communication—perhaps the hardest challenge of all for these growers. Given this caveat, the following section describes the feasibility study and its results.

Feasibility Study Results

For simplicity, three crops were included in the study: spinach, summer squash, and winter squash. Although these were not the favorite choices of consumers, the growers did have a comparative advantage with these products; thus, the presumption was that if a processing plant could not cash-flow under the best-case scenario,

it would be difficult to achieve success if the cooperative were to produce the more popular consumer choices. These three crops provided a potentially early start to the processing season and would extend production until late fall. Two processing lines were included in the analysis: a processing line for spinach and a processing line for squash (both summer and winter). Although the farmers collectively had about 3,500 acres to farm, the study examined a scenario with 12,000 acres because the producers wanted to have the ability to expand in the future.

The spreadsheet templates illustrated in figure 3 describe the feasibility study. Central to the figure is the Summary Template which lists the economic value of the project. The Production Schedule Template reported summary statistics regarding production and days of processing. An Amortization Template provided capital investment information. The Vegetable Enterprise Budgets fed members' production information into the analysis. The Income Statement Template and Cash Flow Template provided essential information as to the financial performance of the investment. Three different investment scenarios were created to allow for different production levels in the field.

Feasibility results are reported in tables 5 and 6. The study was first conducted using only one freezing tunnel. A second tunnel was then added, which expanded the number of vegetables that could be processed to 10,000 pounds/hour. A scenario was also created to allow for the production of 25,000 pounds of vegetables per hour. These expansion scenarios were added to the study because the producers believed economies of scale would be achieved with the larger numbers. However, expansions were eventually rejected because losses increased from (\$1,405,713) before taxes to (\$4,216,919) (see table 6). Losses are attributed to the cost of labor and the very expensive land along the front range of northern Colorado, which simply would not allow for positive cash flows under the various scenarios. Second, the ability to produce this much produce, coupled with the need to market the increased amount, would prove to be extremely difficult.

Recommendations

Market Study

Given the results from both the marketing and feasibility studies, it was recommended that the cooperative begin on a small basis—markets for locally grown products appeared to exist; and while these growers may not yet be ready to put the action plan together, they could focus on what they can do well. It was recommended that the group bring in two types of expertise to help with the marketing cooperative endeavor: both a marketing and a sales person. The marketing person would be hired as an employee or as a contractor, but would possess the skills and knowledge necessary to develop and to direct a strategic marketing and promotional campaign for the produce industry. Based on the vegetables to be grown and marketed, this person would need to put the action plan together in order to (a) identify the distinctive competency (competitive edge) of each vegetable, (b) target specific

Table 5. Summary of Feasibility Results: Production Information Using Three Different Scenarios

Vegetable	— SCENARIO —		
	One Freezing Tunnel	Two Freezing Tunnels	Expanded Plant
Spinach	5,000 lbs./hour; two 10-hour shifts; 2,800 acres	10,000 lbs./hour; two 10-hour shifts; 5,600 acres	25,000 lbs./hour; one 10-hour shift; 6,000 acres
Summer Squash	2,000 lbs./hour; two 10-hour shifts; 1,200 acres	4,000 lbs./hour; two 10-hour shifts; 2,400 acres	10,000 lbs./hour; one 10-hour shift; 3,000 acres
Winter Squash	2,000 lbs./hour; two 10-hour shifts; 1,200 acres	4,000 lbs./hour; two 10-hour shifts; 2,400 acres	10,000 lbs./hour; one 10-hour shift; 3,000 acres
Total Acreage	5,200 acres	10,400 acres	12,000 acres

Table 6. Summary of Feasibility Results: Income Levels Using Three Different Scenarios

Description	— SCENARIO —		
	One Freezing Tunnel	Two Freezing Tunnels	Expanded Plant
Investment	\$7,256,490	\$7,874,216	\$20,868,587
Total Acreage	5,200	10,400	12,000
Net Cash Flow	(\$858,371)	(\$803,082)	(\$1,892,165)
Income Before Taxes	(\$1,405,713)	(\$1,431,084)	(\$4,216,919)

markets, and (c) develop the promotional and sales strategy for infiltrating those markets. Further, this marketing person would be charged with developing a reseller's support program to provide the reseller with tools for selling produce. This person would also have the responsibility for monitoring and evaluating the progress of the strategic program.

The responsibility of the sales person would be to execute the strategic marketing plan. Once the targets are identified—be they grocery stores, government installations, universities, health-care systems, or hotels/resorts/casinos—the sales person would contact each and every entity in that market using proven sales techniques to increase the probability of “Colorado-grown” vegetables being purchased. The various agencies expressed a willingness to work with the producers as long as they could provide consistency of product and delivery. Although the growers would not receive a premium for the product from the government installations, they would have additional outlets for their vegetables, one of the original goals of the cooperative. The sales force would be responsible for the continued service in the market in order to expand the variety and the quantities of vegetables sold.

It was also important to heighten the awareness of the Colorado cooperative while instilling consumer and reseller confidence in “Colorado-grown” products. To accomplish this, it was recommended that a co-branding program also be developed.

This program would include the design of a logo, tag line, imagery, and messages for inclusion on all vegetables, related packaging, containers, correspondence, and promotional material where appropriate. This branding strategy is the cornerstone for increasing sales of “Colorado-grown” vegetables, and the task would be delegated to the marketing person.

The cooperative might also develop a “seal of approval” or a “quality seal” for vegetable labels and for packaging to increase consumer confidence in the produce using both a “push” and “pull” marketing strategy. “Push strategies” use promotional campaigns and personal selling to “push” the produce from the producer/cooperative down the supply channel to the reseller. Another way of looking at this strategy would be for the cooperative to decide what it will produce and then go about developing the market for its sale. A “pull strategy” is a marketing strategy aimed directly at the consumer/customer, and generates a demand that then causes the channel member to seek out the product, thus “pulling” demand down from the producer. Producers using this strategy first develop the demand for their product in the market place and then they make their production decisions based on what the consumer/customer wants. Used separately, either strategy is a sound marketing practice; however, the two strategies coupled together greatly increase the probability of success.

Finally, given the difficulty of breaking into the reseller’s market, it would be necessary to develop a reseller’s support program to include sales tools for selling the produce (usage charts, recipe ideas, variety-by-use charts), providing consumer feedback, suggestions, and display ideas to help the reseller to sell the produce. Consideration should also be given to display options, and innovative teaming with complementary foods can help the entire channel to perform better (Hine, Loureiro, and Meyer, 2001).

Feasibility Study

Given the strong demand for Colorado-grown fresh vegetables, it made sense for the growers to engage in some form of vertical integration and to build (or to purchase) a refrigerated holding facility for fresh vegetables. By banding together, the growers could build a branded product that would appeal to Colorado buyers. Additionally, with the proper marketing, the more popular branded vegetable products could even be sold to other regions of the country—much as the Idaho potato is seen as a branded item and is easily recognized by many consumers. However, the creation of a refrigerated holding facility still did not solve the problem of getting brokers/distributors to buy their products only on a seasonal basis. Current market prices simply did not support the investment and operation—cash flows were negative for all simulation scenarios. Thus, no breakeven point was attainable.

Furthermore, the feasibility study used the best-case scenario estimates for operation, and the three vegetables examined (spinach and summer and winter squash) simply were not the vegetables of choice for consumers. In fact, producing enough vegetables to make any plant worthwhile would only increase supply, further driving

down already low prices. If a processing plant were still desired, the group might pursue an existing facility, redesigning it as necessary. Of course, an existing plant purchase would require a new feasibility study. Building a holding plant for just fresh vegetables provided another option whereby the group could form a marketing cooperative to market freshly grown Colorado vegetables. Although this option did not solve the year-round vegetable delivery issues, it did provide the group with a new idea for getting their products to market, and it was recommended that they consider this as another alternative.

In order to compete effectively, it seemed advisable for the group to develop a strong marketing plan for their fresh “Colorado-grown” products, and perhaps enter into business alliances with larger vegetable producers. Unfortunately, this was not the advice the cooperative’s producers wanted to hear. Nevertheless, if these Colorado producers can develop and offer a branded, locally grown, premium product, and plan their knowledge management scheme well, they may have a better opportunity to distribute their product as well as supporting fresh markets they are able to develop during the growing-season months. Moreover, the successful development of a premium, branded, locally grown vegetable product could lead to some form of integration with larger and even more efficient vegetable growers nationwide.

References

- Aquino, H. L., and C. L. Falk. (2001). “A case study in the marketing of ‘wolf-friendly’ beef.” *Review of Agricultural Economics* 23(2), 524–537.
- Azzam, A. (1996). “Testing the monopsony-inefficiency incentive for backward integration.” *American Journal of Agricultural Economics* 78, 585–590.
- Bastian, C. T., D. M. Oakley-Simpson, D. M. McLeod, D. J. Menkhaus, D. Alsup, J. Ogden, and G. D. Whipple. (1999). “Niche market potential: The case of the U.S. draft brewing industry.” *Review of Agricultural Economics* 21(2), 552–562.
- Calvin, L., and R. Cook (coordinators). (2001, January). “U.S. fresh fruit and vegetable marketing: Emerging trade practices, trends, and issues.” ERS Report No. 795, USDA/Economic Research Service, Washington, DC.
- Carlton, D. (1979). “Vertical integration in competitive markets under uncertainty.” *Journal of Industrial Economics* 2(3), 189–209.
- Colorado Department of Agriculture. (2000). *Colorado Census, 2000*. Denver, CO. Online. Available at <http://dola.colorado.gov/demog/census/Census2.cfm>.
- Dimitri, C., A. Tegene, and P. Kaufman. (2003, September). “U.S. fresh produce markets: Marketing channels, trade practices, and retail pricing behavior.” ERS Report No. 825, USDA/Economic Research Service, Washington, DC.
- Frank, S., and D. Henderson. (1992, November). “Transaction costs as determinants of vertical coordination in the U.S. food industries.” *American Journal of Agricultural Economics* 74(2), 941–950.
- Hennessy, D. (1996, November). “Information asymmetry as a reason for food industry vertical integration.” *American Journal of Agricultural Economics* 78, 1034–1043.

- Hine, S., M. Loureiro, and S. Meyer. (2001, July). "Marketing Colorado potatoes as a value-added product: A case study." *Journal of Food Distribution Research* 32, 45–53.
- Jewkes, J. (1930, August). "Factors in industrial integration." *Quarterly Journal of Economics* 44(4), 621–638.
- Kaufman, P., C. Handy, E. McLaughlin, K. Park, and G. Green. (2000, August). "Understanding the dynamics of produce markets." Agricultural Information Bulletin No. 758, USDA/Economic Research Service, Washington, DC.
- Kluge, J., W. Stein, and T. Licht. (2001). *Knowledge Unplugged*. Bath, Great Britain: Bath Press.
- Koulopoulos, T. M., and C. Frappaolo. (1999). *Smart Things to Know About Knowledge Management*. Oxford, Great Britain: Capstone Publishing, Ltd.
- Loureiro, M., and S. Hine. (2002). "Discovering niche markets: A comparison of consumer willingness to pay for local (Colorado-grown), organic, and GMO-free products." *Journal of Agricultural and Applied Economics* 34(3), 477–487.
- Loureiro, M., J. J. McCluskey, and R. C. Mittelhammer. (2003). "Are stated preferences good predictors of market behavior?" *Land Economics* 79(1), 44–55.
- Perry, M. (1989). "Vertical integration: Determinants and effects." In R. Schmalensee and R. Willig (eds.), *Handbook of Industrial Organization* (pp. 183–255). New York: Elsevier Science Publishers, B.V.
- Reaves, D. W., R. A. Kramer, and T. P. Holmes. (1999). "Does question format matter? Valuing an endangered species." *Environmental and Resource Economics* 14(3), 365–383.
- U.S. Department of Agriculture, Economic Research Service. (2001a, January). *Understanding the Dynamics of Produce Markets*. USDA/ERS, Washington, DC.
- . (2001b). *Vegetables and Specialties Situation and Outlook Report*. USDA/ERS, Washington, DC.
- U.S. Department of Commerce, Census Bureau. *2000 Census of the Population: General Population Characteristics, U.S. Summary*. Washington, DC, 2003. Online. Available at <http://www.census.gov>.