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The Feasibility of a Fresh Fruit and Vegetable Processor in Saluda County, South Carolina

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THE FEASIBILITY OF A FRESH FRUIT AND VEGETABLE CO-PACKER IN SALUDA COUNTY, SOUTH CAROLINA

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ABSTRACT

This research looks at the topic of agriculture and agricultural processing as a means for rural economic development. The purpose of the study is to determine the feasibility and desirability of a fruit and vegetable processor in Saluda County, South Carolina. A fruit and vegetable co-packer was chosen because of positive community response to the idea, large and growing fruit and vegetable production in the county, lack of fruit and vegetable processing in the county and growing demand for fresh cut and frozen produce. The proposed processor would produce sliced, frozen, bagged peaches during peach season and cut, frozen, bagged vegetables when peaches are not in season. The costs versus the revenues of the proposed facility were estimated to determine its profitability and feasibility. The desirability of the proposed processor was analyzed by examining the potential economic impacts on Saluda County through an input-output model of the regional economy constructed with the software program IMPLAN. Results of the model provided estimates of the direct, indirect and induced effects of the processor.

It was concluded that the proposed facility would be both financially feasible and profitable. In addition, the processor was determined to have desirable economic impacts on Saluda County, providing jobs and an infusion of spending across several sectors in the local economy. This research exemplifies the potential for agriculture and agribusiness as a viable method for economic development.

DEDICATION

This thesis is dedicated to the friends and family who made my graduate career possible through their support and encouragement.

ACKNOWLEDGMENTS

I’d like to acknowledge and thank my committee members, Dr. Hughes, Dr. Carpio and Mr. Crissy for taking the time out of their busy schedule to guide and help me with my research.

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CHAPTER I

INTRODUCTION

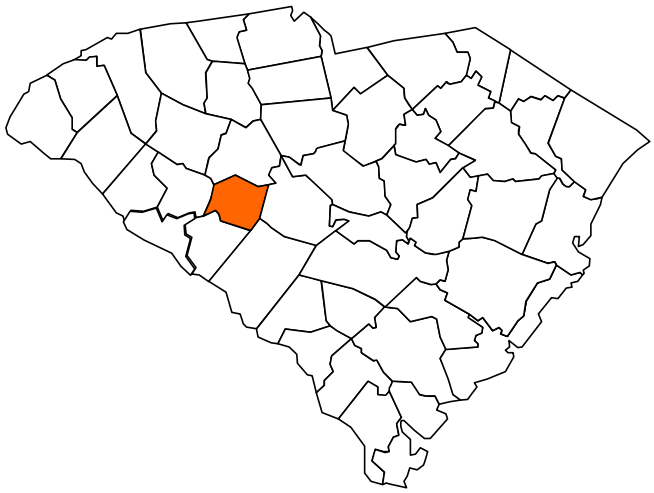
Agriculture is an important part of community and economic development in many rural communities. Agriculture itself provides jobs, has economic impacts and also has strong growth linkages and multiplied effects on nonagricultural sectors, which magnifies its impact. Farming and the processing of agricultural products also form the economic basis for many rural communities in the United States. Hence, promoting and expanding agricultural-based processing is a viable way to improve their economies.

A previous study, "Saluda County: An Agribusiness Strategic Plan with an Emphasis on Value-Added Processing" (Hughes, Swindall, Macdonald, & Purcell, 2012), demonstrates how agriculture can be an impetus for economic development in Saluda County, South Carolina. The study highlights potential agriculture industries that could promote economic development in part by generating employment opportunities and increasing the size of the local tax base.

Saluda County is located in the central part of South Carolina (Figure 1.1) and has a total area of 462 square miles, of which 452 are land and nine are water. Major towns in Saluda County include Saluda (the County Seat), Ridge Spring and Ward. A portion of the town of Batesburg-Leesville (primarily in Lexington County) is also in the County. Saluda County is a rural area conveniently located in proximity to major metro areas in the southeast including 50 miles from the town of Saluda to Columbia, SC, 45 miles to

Augusta, GA, 170 miles to Atlanta, GA, and 150 miles to Charleston, SC (Hughes, Swindall, Macdonald, & Purcell, 2012).

Figure 1.1: Map of South Carolina and Saluda County



Saluda County has deep agriculture roots. It has 35,031 acres of cropland and 41,046 acres of woodland (USDA, 2007). According to 2007 Census of Agriculture, 109,791 acres of land in Saluda County was engaged in farming. Saluda County had 606 farms with an average size of 181 acres (USDA, 2007). In 2009, total cash receipts from farming in Saluda County amounted to $87 million, with about one fourth ($20 million) due to crops, and the three quarters ($67 million) from livestock sales (USDA, 2010). Saluda County ranked fifth out of the 46 South Carolina counties in terms of cash receipts from agricultural sales in 2010 (USDA, 2010).

Saluda County has a very strong employment base in farming. The number of farm jobs in Saluda County is 13.3%, over six times the relative contribution for both the Saluda region and the State (both at less than 2.0%) (Hughes, Swindall, Macdonald, & Purcell, 2012).

The estimates of employment and value of output for specific agricultural based sectors in the Saluda region display the importance of poultry-based activities (Table 1.1). Logging and fruit farming are also important to the regional economy (Hughes, Swindall, Macdonald, & Purcell, 2012). However, despite its abundant agriculture, there is little agriculture processing within the county with the notable exception of the very strong poultry processing industry (Hughes, Swindall, Macdonald, & Purcell, 2012).

Despite its strong agricultural base, Saluda County is not without its economic development problems. “Saluda County experienced slow, below average growth between 2000 and 2010. While population in Saluda County grew from 1990 to 2000 by 16.7%, it grew at the much slower rate of 3.6% between 2000 and 2010 (markedly lower than both the U.S. and South Carolina averages)” (Hughes, Swindall, Macdonald, & Purcell, 2012, p. 7).

Table 1.1: Agricultural Output and Employment in the Saluda Region in 2009

Key Industries	Annual Output (Millions of $)	Employment
Poultry Processing	1,035.71	4,792
Animal Slaughtering	470.913	1,027
Poultry and Egg Production	314.704	989
Commercial Logging	196.42	968
Fruit Farming	36.684	643
Cattle Ranching	28.98	379
Greenhouses/Nurseries	28.76	452
Dairy Cattle and Milk	22.169	284
Vegetable and Melon Farming	21.545	201
Animal Production (Except Poultry and Cattle)	15.373	669
Grains	10.173	309

Source: IMPLAN Group Inc. 2000

Another issue in Saluda County is that of out-commuting. “Of the people who live in Saluda County and have a job, only 24.7% work in the county while 44.9% work in neighboring counties. Of those workers who live in Saluda County, 27.5% travel from 25 to 50 miles to work while 20% travel greater than 50 miles and only 20.2% travel less

than 10 miles. In comparison, the average travel time to work for those living in Saluda County is 28.3 minutes" (Hughes, Swindall, Macdonald, & Purcell, 2012, p. 11).

Based on its strong agriculture base but lack of agriculture processing in the county, the Hughes, Swindall, Macdonald, & Purcell study suggested that Saluda County could benefit from having more outlets for value-added agriculture processing. Expanding on current agriculture by adding value to it is a viable way for Saluda County to improve its economic development. One of the highly recommended, value-added industries for Saluda County in the Hughes, Swindall, Macdonald, & Purcell study is a co-packer for fresh fruits and vegetables. A co-packer is a business that manufactures and packages foods for other companies to sell (Rushing, 2012).

The recommendation of a fresh fruit and vegetable processing co-packer warrants further evaluation to see if it is financially feasible in Saluda County. Additionally, the desirability of a co-packer should be gauged with regard to community development in Saluda County. This research will build upon the Hughes, Swindall, Macdonald, & Purcell study and evaluate the feasibility and economic impact of establishing a co-packer in Saluda County.

The specific objectives of this study are to:

1) Review the assets in Saluda County, including previously identified potentially viable industries.
2) Determine the feasibility of a co-packer in Saluda County.
3) Evaluate the desirability and economic impact of a co-packer in Saluda County.

The chapters of this thesis are as follows. Chapter II reviews literature on the relationship between agriculture and economic development and how agriculture can be used as a means for economic development in communities. Chapter III estimates the financial feasibility and profitability of a fresh fruit and vegetable processor in Saluda County. Chapter IV assesses the facility's economic impact on Saluda County and its desirability as a new industry in the county. Chapter V summarizes the findings and makes conclusions and recommendations for further research.

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter will review literature on the subject of using agriculture as a means for economic development in communities. Agriculture directly provides jobs and economic activity and also has strong growth linkages and multiplied effects on nonagricultural sectors (Byerlee, De Janvry, & Sadoulet, 2009). A wide body of literature evaluates the relationship between agriculture and economic development. Despite concerns and issues, there are many advantages of promoting agriculture for community development, including both economic and social benefits. There are a variety of agriculture industries a community can use to promote economic development. Prior to employing a new agriculture industry, the feasibility should be evaluated to determine if it could be successful in a community given the community's current local assets.

Before discussing the economic development of rural communities, it is important to first identify what a rural community is. A rural community can be defined as having a low population density and being dependent on natural resources (Kilkenny, 2010). According to the United States Census Bureau's classification, "rural" "consists of all territory, population, and housing units located outside of UAs [urban areas] and UCs [urban clusters]. The rural component contains both place and nonplace territory" (U.S. Census Bureau, 2011, no page). Rural communities and their citizens have their own

unique problems that urban communities do not face. Many rural communities are declining in population because of outmigration (Kilkenny, 2010). The young and the educated in particular are moving from remote rural areas to more urban communities due to better returns on their human capital (B. Mills & Hazarika, 2001). Outmigration also reduces the population density. Low population density can be problematic for rural communities. The cost of providing publically provided goods tends to be more expensive. Also the tax base of the community tends to decrease with the remaining citizens bearing an increased tax burden (Kilkenny, 2010).

Problems with Communities Relying on Agriculture for Community Development

Although agriculture is commonly depended on for community development in rural areas, it is not without its problems. For example, agricultural jobs usually require lower skill sets than other industries. Many agriculture jobs require only unskilled labor (Anríquez & Stamoulis, 2007). If a community relies on agriculture for its economic development, it may not be promoting an educated workforce. An educated workforce is hypothesized to lead to faster local economic growth in several ways (Barkley, 2001). It increases the ability of local businesses to respond to changing technologies and economic conditions (Barkley, 2001). It also increases the probability that a community will attract new business to the area, especially high technology industries (Barkley, 2001). Finally, an educated workforce will benefit entrepreneurial activity and small

business development by attracting and retaining entrepreneurs (Barkley, 2001).

Because agriculture workers are usually unskilled, they earn relatively low incomes and have low benefits. Farming, fishing and forestry occupations have a mean annual income of $24,330 (Bureau of Labor Statistics, 2011). This is 45% less than the national average of $44,410 (Bureau of Labor Statistics, 2011). Low pay means workers have less money to spend on local business, less tax revenue is generated to support provided public services, and it may lead to greater demands on publically provided services such as food stamps and housing assistance (Greenwood, Holt, & Power, 2010). In addition, lack of benefits may mean more uninsured patients at community hospitals and clinics (Greenwood, Holt, & Power, 2010).

There are other problems associated with a community depending on agriculture for its economic development. Government farm subsidies are related to outmigration from rural communities (Goetz & Debertin, 1996). A study on rural populations in the 1980's found that higher farm program payments were associated with significantly higher rates of population out-migration from a county (Goetz & Debertin, 1996). The study also noted that off-farm income is important to preserve rural areas, because in many cases supplemental income received from off-farm jobs helps sustain farm operations (Goetz & Debertin, 1996).

Benefits of Using Agriculture for Community Development

There are many examples of how agriculture has positively impacted communities. When farmers increase revenue or employment or expand their farms, it has a favorable economic impact on the surrounding community (McConaghy, 2007). Economic impact is "the estimated changes in a region's employment, income, and level business activity that result from a certain program or project that affected the region" (Zimmerschied, Woods, Willoughby, Holcomb, & Tilley, 2003, p. 12). Newly introduced or expanded local agriculture can improve the development of a rural community by expanding its economy. Agriculture growth can improve non-farm industries, provide entrepreneurial opportunities, and increase farmers' incomes. When local agriculture markets expand, the money consumers spend remains in their local community (Martinez, 2010).

Agriculture plays an important role for most counties in Florida. Researchers noticed that in counties such as DeSoto, Glades and Hendry, farm and agricultural services income accounted for 30% to 40% of county total earned income (Benioudakis & Brown, 2000). This income was largely due to the citrus industries in those counties. Over the past several decades, the number of citrus farms decreased but the size of those farms increased (Benioudakis & Brown, 2000). Florida producers add value to their products in several ways. Using packinghouses, they clean, sort and wax fruit. The fruit also is commonly processed into juice. IMPLAN (IMpact analysis for PLANning) was developed by the US Forest Service and is used to construct input-output models for

geographic areas in the United States (Lobo et al., 1999). By using IMPLAN, researchers estimated that the dollar sales of exported citrus generates $1.77 in economic activity in Florida from the sales of all goods and services. The impact of the Florida industry from 1994-1995 through 1998-1999 was estimated at $6.8 billion in gross revenue and 61,332 jobs.

Agriculture improves other sectors besides the agriculture sector by increasing income generated by the non-farm rural economy (Anríquez & Stamoulis, 2007). Although the majority of rural communities in America are dominated by nonagricultural employment, local industries and farms are interdependent in many cases (Whitener & McGranahan, 2003). In rural areas, many industries depend on agriculture, such as processing and marketing agricultural goods, and retail of agriculture goods. Job creation in rural communities often comes from rural industries related to farming (Whitener & McGranahan, 2003). Because agriculture and agricultural industries are so closely tied in rural communities, agriculture growth can increase the demand for the goods and services of non-agriculture sectors (Anríquez & Stamoulis, 2007).

One reason that agriculture improves the economy of non-agriculture industries in a community is because of forward and backward linkages. Linkages show the strength of the relationship between final demand and output (Horowitz & Planting, 2006). Forward linkages show the strength of an industry's tie to final-demand changes (Horowitz & Planting, 2006). Forward linkage effects are "every activity that does not by its nature

cater exclusively to final demands, will induce attempts to utilize its outputs as inputs in some new activities" (Hirschman, 1988, p. 100). Agriculture would have a forward linkage relationship to an industry in the area to which it sells its outputs. For example, a corn farm has a forward linkage with an industry in the area that buys its corn and turns it into cornmeal. In agriculture, forward linkages are mainly related to agricultural and food processing industries (Anríquez & Stamoulis, 2007). Local forward linkages are particularly strong when the agricultural product that is processed is bulky or perishable (Hughes, 2012). Because these goods are difficult to transport, the processing often occurs locally (Hughes, 2012). This means that much of the money spent on processing will remain local (Hughes, 2012).

Backward linkages show the strength of an industry's final demand on output (Horowitz & Planting, 2006). Backward linkage effects are "every nonprimary economic activity, will induce attempts to supply through domestic production the inputs needed in that activity" (Hirschman, 1988, p. 100). Agriculture would have a backward linkage relationship to an industry in the community from which it gets its inputs. Although agriculture is a relatively small sector in the United States economy, there are significant backwards linkages from agriculture to the rest of the sectors of the economy (Adelman & Robinson, 1986). If local agriculture has strong local backwards linkages, growth in agriculture production can have a positive economic effect on a community (Adelman & Robinson, 1986).

One example of how agriculture is linked to the local economy as a whole can be seen in a working paper from Washington State University. Using data from IMPLAN, researchers used an input-output analysis to compare the economic impacts of conventional apples versus organic apples in Washington State (Mon & Holland, 2006). Based on their input-output analysis they concluded that even though organic apple production uses fewer inter-industry inputs than conventional, organic apples are more labor-intensive and profitable which makes them have larger direct and induced impacts on the economy (Mon & Holland, 2006).

Another benefit of using agriculture in rural development is import substitution. Import substitution is when externally produced goods are substituted for locally produced goods, such as local foods (Basu, 2005). Import substitution can also occur when the location of intermediate stages of food production moves locally (Martinez, 2010).

The promotion of local foods in a community from import substitution can have many benefits. Local consumers receive fresh, improved quality food, and the social benefit of forming links with farmers (Hughes & Boys, 2012). There are environmental benefits, due to less intense production practices and less transportation needs (Hughes & Boys, 2012). Outlets for local foods include direct marketing to consumers, farmer's markets and retail chains, which are increasingly targeting local foods to sell due to rising demand from consumers.

Community members may switch to locally grown products from imported products if they are priced competitively or if there is perceived added value to those products because of their origin (Martinez, 2010). Consumers find these produce characteristics such as fresh tasting and fresh look, high quality, good value for the money, convenient to buy and reasonably priced (Wolf, 1997). Consumers were willing to buy local produce from farmer's markets instead of from grocery stores if they saw more of those desired characteristics at a farmer's market (Wolf, 1997). Perhaps most important, consumers also value buying local foods because it supports local farmers (Carpio et al., 2008; Stephenson & Lev, 2004). A study based on two Oregon communities showed that 87% of consumers indicated that supporting local farmers was very important to somewhat important in their buying decisions (Stephenson & Lev, 2004).

Arguably, import substitution enhances local autonomy and promotes sustainable development (Bellows & Hamm, 2001). Sustainable development in this case means promoting healthy human (and non-human) environments and local autonomy refers to "the ability to negotiate power and needs from a local starting point across geographic scales… as well as across barriers of socially constructed difference" (Bellows & Hamm, 2001, p. 272). A community's increase in autonomy and development can be measured by the improvement of "fair labor trade, equity and democracy, and environmental stewardship" (Bellows & Hamm, 2001, p. 272). When a community increases its import substitution, it will benefit from increased autonomy, because it is not as dependent on imports from other geographic locations. When community members switch to products

produced locally, the sales are likely to accrue to people and business within the community (Swenson, 2009). This could also lead to additional economic impacts as employees and businesses spend the additional income on production inputs and other items within the local community (Swenson, 2009).

One of the ways that the business activity within a community related to local foods manifests itself is the emergence of local food entrepreneurs. “Local food markets may stimulate additional business activity within the local economy by improving business skills and opportunities” (Martinez, 2010, p. 45). Local food entrepreneurs can have a positive impact on local economies because they start new businesses and increase local consumer spending (Martinez, 2010). Often, they use local agriculture inputs in their products and businesses, which also have a positive impact on local economies. Using local inputs keeps more money within the community and increases the multiplier effect within the community (Barkley, 2001). Also, successful local food entrepreneurs enhance the government tax base. Locally owned firms may provide more managerial and professional positions than branches of facilities (Barkley, 2001). Specifically, international and national companies usually have most of their managerial and professional staff at a central location (Barkley, 2001). Further, most of the profits do not stay in the local community but rather go to the central location (Barkley, 2001). Branch facilities may mean that the company has weak attachments to any one of its locations (Greenwood, Holt, & Power, 2010). In contrast, locally owned businesses usually have

strong local ties (Greenwood, Holt, & Power, 2010). They are less likely to move in search of incentives or for other reasons (Greenwood, Holt, & Power, 2010).

In addition to economic benefits, communities may gain social benefits from the expansion of small-scale, locally based agriculture. Based on a comparison of California communities with large and small-scale agriculture, Goldschmidt argued for the positive benefits to communities that utilize small scale, locally based models of development (Goldschmidt, 1947). In light of Goldschmidt's assertion, local, small-scale, agriculture and agribusiness can play an important part in the health of a community (Hughes & Boys, 2012). Despite its many benefits, production agriculture faces the challenges of urban encroachment in many places, raising costs, and an aging set of farmers.

Potential Agribusiness Activity to Promote Community Development

One way for a rural community to develop its economy is to promote nontraditional agriculture activity. Nontraditional agriculture is "new crops or products to an area, industrial uses of agriculture products, value-enhancement activities and urban agriculture activities" (Barkley & Wilson, 1992, p. 1). The purpose of promoting these activities is to raise local employment and incomes. Examples of nontraditional (alternative) agriculture are aquaculture, wine grapes in South Carolina or apples in Arizona. When developing nontraditional agriculture it is important to consider the

conditions it should meet to have a long-lasting, positive impact on a community. First, the nontraditional agriculture industry must have a long life cycle in order to contribute to the rural economy (Barkley & Wilson, 1992). An industry that that is short-lived cannot be expected to be a significant contributor to an economy. Secondly, the success of a nontraditional agriculture industry must translate directly or indirectly into jobs and income in the community (Barkley & Wilson, 1992).

There are some concerns with depending on nontraditional agriculture for rural development. Like any new business, nontraditional agriculture will face intense competition and unfavorable cost structures (Barkley & Wilson, 1992). Because of limits on market size, alternative agriculture is not a solution to revitalize development overall in rural America, such efforts may offer a significant impact on an individual community (Barkley & Wilson, 1992).

One possible nontraditional agriculture option for a community to consider is to establish a food innovation center. A food innovation center is "any program that offers facilities for food processing and testing, and often includes technical assistance for marketing, business development, and regulation compliance" (Babcock, 2008, p. 2). The purpose of a food innovation center is "assisting food businesses with the development and manufacture of their product, which increases the amount of value-added food processing in a given area" (Babcock, 2008, p. 2). A food innovation center enhances or adds value to local farm products. Benefits include providing an alternative outlet for farms

products, connecting farmers with food entrepreneurs, keeps agriculture dollars circulating in the local economy and making more locally grown and locally processed foods available to the community (Babcock, 2008).

Kitchen incubators are a specific type of food innovation center. Such facilities are "kitchens developed for shared, community use that are designed to offer the chance for entrepreneurs to develop culinary and business skills" (Babcock, 2008, p. 25). These professional quality kitchens can be available for short or long-term leases at subsidized rates (Clark, Howard, & Rossi, 2009). Kitchen incubators make it financially possible for a start-up or established business to have access to a professional kitchen and appropriate storage so that it can further develop (Clark, Howard, & Rossi, 2009). Kitchen incubators also provide a range of technical support and advice to facilitate business success including training, access to appropriate capital, and technical assistance (Wold, 2005). For example, a kitchen incubator can offer services like product development, labeling and branding of products and website development (Clark, Howard, & Rossi, 2009).

Kitchen incubators can also assist food entrepreneurs. A 2006 feasibility study conducted for the leadership of Alamance, Chatham, Durham and Orange Counties in North Carolina analyzed the feasibility and desirability of establishing a regional shared use food and agriculture processing facility. The counties were thought to be a suitable location for such a processing facility because of strong entrepreneurial presence, existing local food presence, and lack of available manufacturing space for beginning food

businesses (S. Mills, 2007b). Based on surveys results, the researcher determined that there was a strong demand in the four counties for the facility (S. Mills, 2007b).

A study by Cameron Wold examines the feasibility of a kitchen incubator in Clallam County, Washington. The study includes market research of kitchen incubators, budget information, feasibility conclusions, management and marketing plans. The budget information is useful because it gives the breakdown of building and equipment costs for facilities of two different sizes (15,000 and 20,000 square feet).

Kitchen incubators not only help the entrepreneurs directly, but they also have positive economic impacts on the surrounding community. When a firm becomes successful they often provide more local employment opportunities (Wold, 2005). Several studies have examined the economic impact of kitchen incubator facilities. For example, clients using a facility in Oklahoma generated an estimated 8,863 full time jobs and $1.949 million in total annual sales (McConaghy, 2007). The Bonner Business Center in Sandpoint, Idaho (population 5,000) created 125 jobs since 1992 (Wold, 2005). A kitchen incubator in Taos, New Mexico kitchen produced 219 jobs in six years, and the AceNet Kitchen in Athens, Ohio produced 145 jobs in its first three years of operation (Wold, 2005).

A co-packer is another possible business opportunity for a community to consider. A co-packer, or contract packer, is a business that manufactures and packages foods for other companies to sell (Rushing, 2012). The specific range of services offered by co-packing

firms varies and can include liquid or dry product manufacturing, ingredient pre-blends, labeling, packaging services, product development, and recipe conversion (Babcock, 2008). Co-packers take the raw goods from a farm and turn them into value-added products. A co-packer may function only as a packer of other companies' products or it may be in business with its own product line (Rushing, 2012). A co-packer could be manufacturing several competing products at the same time (Rushing, 2012). Co-packed products can range from national brands to private label brands (Brady, Seideman, & Morris, 2009).

A co-packer builds on existing agriculture in the community. The variety of services available from a co-packer will vary depending on the size of the co-packer and the type of facilities and the capacity of their facilities (Rushing, 2012). A co-packer can exist at many different levels of scale. It can be very large scale, using inputs from several farms, or it can be very small scale, taking place in a community kitchen (Babcock, 2008). There are also different levels of processing with co-packing. Co-packing can be as simple as washing and waxing fruit or can be much more complex such as using complicated recipes to convert raw products into finished goods (Babcock, 2008). Both scale and complexity can be adjusted according to the needs and size of local agricultural products.

There are several advantages for entrepreneurs to use a co-packer. Because a co-packer has already established its production line, a co-packer can often manufacture a product cheaper than farms can manufacture it themselves (Brady, Seideman, & Morris, 2009).

Capital costs for equipment and facilities can be very large and prohibitive for entrepreneurs to produce a product (Rushing, 2012). Using a co-packer also reduces startup costs when beginning to produce a new produce (Brady, Seideman, & Morris, 2009). Using a co-packer helps to more accurately predict overhead costs and can also reduce the start-up time of producing a new product because the co-packer has already established the manufacturing and labeling systems (Brady, Seideman, & Morris, 2009). A co-packer experienced in product development and food processing can be very useful. For example, a co-packer may be able to covert raw agricultural products into marketable products based on complex recipes (Brady, Seideman, & Morris, 2009). A study concerning the feasibility of a fresh-cut produce co-packer by David Boyd of Yellow Wood Associates (2004) gives a description of the production process, fixed and variable costs, and the specifications of the facility and equipment that are needed. It also gives several scenarios of the industry's feasibility based on variations of demand, supply and operational costs.

Glory Foods Company is an example of how a co-packing operation can have a positive effect on the surrounding community's economy. Glory Foods is an ethnic foods company that specializes in southern-style food in canned, frozen and fresh-cut forms (Robinson 2005). The processing plant in Montezuma, Georgia harvests from a 200-mile radius of edible greens (Robinson 2005). A study noted that the facility originally started with 16 employees in 2003 and by 2005 it employed more than 270 employees (Robinson

2005). The team also gathered that 95% of the employees are local residents and that the facility is one of the major employers in the region.

Slaughterhouses, or meat processing facilities, are another way for communities to improve their economic climate by creating jobs and exportable meat products. Researchers evaluated the economic feasibility of a producer-owned entity in Nevada to slaughter, process, and market locally grown, grass-fed meat products (Curtis et al., 2006). They concluded that there was a large niche market of buyers for such products. Based on two surveys and their cost estimates, Curtis et al. calculated potential annual profits of $0.55 million to $1.4 million and they deemed such a facility to be feasible (Curtis et al., 2006).

Another study examined the feasibility of a small-scale small-animal slaughter facility for independent meat producers in North Carolina. A survey of small farmers revealed a strong presence by farmers for small volume processing of small meat animals, such as poultry and rabbits (S. Mills, 2007a). An unmet demand for access to US Department of Agriculture or state-inspected animal slaughter facility was also demonstrated for this market (S. Mills, 2007a). The authors of the study recommended developing a pilot plant for the processing and slaughtering of multiple species of poultry and rabbits (S. Mills, 2007a). The facility should be managed as a non-profit entity, focusing on training and educating producers in addition to providing processing services (S. Mills, 2007a). The Foothills Pilot Plant is now open in Marion, NC. It serves small western North Carolina

farmers by processing chicken, rabbits, ducks, geese and turkeys (NC Choices, 2012).

A private label slaughterhouse facility allows farmers to have their meat processed as they request and returned with the farmer's private label attached (Hughes et al., 2011). This way, farmers can sell their products themselves to whichever market they prefer. A shortage of private label slaughterhouses in South Carolina has been noted in several previous studies (Carpio et al., 2008; Hughes et al., 2011).

In addition to considering the feasibility of this industry, it is also important to think about what kind of overall economic impacts a meat-processing center would have on a community. A study noted how a large meat processing facility affected Garden City's economy, employment and population. The authors noted that between 1979 and 2000, the number of meatpacking jobs increased by 5,000 in the county as a result of the introduction of several meat processing facilities in the area (Broadway & Stull, 2006). Despite the abundant amount of jobs from the facilities, the jobs were generally low paying and only part-time (Broadway & Stull, 2006). The result of so many low paying positions was that the number of people living in poverty doubled in the area and the local government had more of a burden to assist the needy by providing free school lunches and other services (Broadway & Stull, 2006). However, the working conditions and economic impacts can vary with different types of meat processing plants. A study about the feasibility of a modern, small-scale, multi-species harvest and meat-processing plant shows pay levels comparable to the regional average (ranging from 79-104% of the

average income in the area) (Hardesty et al., 2006). The facility was projected to increase the gross value of the livestock in the area, generate up to 44 jobs, and have a positive multiplier effect on other sectors of the local economy (Hardesty et al., 2006).

Similarly, a New Zealand study of small-scale specialty meat-processing facilities finds better working conditions than for a typical meat facility especially because of better pay and more training, leading to lower turnover rates (Bjerklie, 2009). Specifically, one type of small-scale meat-processing facility that could be a good option for a community is a private label slaughterhouse facility (Bjerklie, 2009). A private label slaughterhouse facility allows farmers to have their meat processed as they request and returned with the farmer's private label attached (Hughes et al., 2011). This way, farmers can sell their products themselves to whichever market they prefer. There is a shortage of the private label slaughterhouses considering the growing demand for such types of slaughterhouses (Hughes et al., 2011). Generally, these types of slaughterhouses are small and have good working conditions and pay for the workers.

Fruit and vegetable processing is a possible industry for a community to consider. By processing fruits and vegetables, a community can add value to their agricultural products. Fruits and vegetables are very versatile and can be processed in a number of ways including canning, freezing, washing, waxing, chopping and packaging.

One example of a successful fruit and vegetable processer is a canning facility in Colquitt

County, Georgia. The business uses its own produce as well as local, Georgia produce to create canned goods sold under the Lauri Jo label (Luke-Morgan, 2011). The goods are sold locally in Colquitt County, online, and through retailers throughout the southeastern states. An expansion of the processing facility would be mainly used for processing goods under Lauri Jo's own name, but it would also have a section for the co-packing of products from other small food producing entities. Given a reasonable range of price per jar, the expansion of the processing facility was seen as providing a reasonable return on investment above specified cost. The processing facility would also have local economic impacts. The direct output impact, equal to the value of annual revenues, is projected at $693,600. The facility is projected to employ 10 full-time employees and generate tax revenue of $12,399 for the area (Luke-Morgan, 2011).

Waste from agricultural production is a resource that could also support economic activity in a community. Farming generates large volumes of waste. Significant amounts of row, fruit, and vegetable crops are either often left in the field or otherwise discarded because of damage, low market prices, or weather. Besides reducing revenue for farmers, such waste can also results in methane emissions, a greenhouse gas that is up to twenty times more damaging to the environment than the major greenhouse gas, carbon dioxide (Oliver, 2008). Some of the potential uses for the waste are repurposing it into wine, brandy, food products, ethanol/biofuels and animal feed.

Farmer's markets are another option for value-added agriculture. A farmer's market is

defined as a public gathering with two or more producers for direct sale of agriculture products from producers to consumers (New York Farmers' Market, 2006). Farmer's markets size can range from small to very large, such as the Pike Place farmer's market in Seattle, Washington. Farmer's markets usually meet once a week and the products typically sold are fruits, vegetables and more processed items, such as baked goods, cheeses and meats (New York Farmers' Market, 2006).

A Farmer's market can be a social asset to communities. Farmer's markets have documented economic impacts on communities, although they tend to be small (Feenstra, 2007; Hughes, Brown, Miller & McConnell, 2008; Otto & Varner, 2005; Stephenson & Lev, 2004). By combining market transactions with social interactions, especially between farmers and the rest of the community, farmer's markets can make shopping for food a community experience (Feenstra, 2007).

Agritourism can be a valuable addition to pre-existing agriculture. Agritourism is "any income-generating activity conducted on a working farm or ranch for the enjoyment and education of visitors" (Rilla, Hardesty, Getz, & George, 2011, p. 57). Agritourism can enhance, diversify and increase revenue for local farms (Lobo et al., 1999). Examples of agritourism are pick-your-own produce, petting zoos, hayrides and farm tours. Agritourism can promote rural economic growth by bringing in new visitors to the community and create synergies with existing tourism commerce. Agritourism can also help with education and promotion of agriculture (Carpio et al., 2008). It can be a way to

make community members more aware of the existence of local agriculture and encourage them to buy locally grown, often value-added agricultural products (Lobo et al., 1999). Another benefit of agritourism is that it has relatively few demands on public services and relatively little impact on the local environment (Barkley, 2001).

Agritourism has economic impacts in South Carolina. About 700 South Carolina farms received income from agritourism activities in 2002 (Carpio et al., 2008). The corresponding aggregate income is approximately $4 million, although this figure is likely underestimated (Carpio et al., 2008).

Feasibility of New Industries

Feasibility studies are important to conduct before establishing a new industry in that financial feasibility (including estimated costs compared to estimated revenue) is required. “Before any firm initiates a new enterprise or method of producing and marketing a product, however, it should determine whether the proposed venture is economically viable- that is, will it be profitable? A feasibility analysis is designed to determine whether a specific proposal is economically sound” (Schermerhorn & Makus, 1987, p. 1).

There are many facets of a feasibility study. Agribusiness feasibility studies are generally composed of two main parts, analysis of directly influencing factors and analysis of environmental conditions (Schermerhorn & Makus, 1987). In the analysis of directly influencing factors, the firm should consider what factor must be considered to determine whether the proposed venture should be considered, the costs involved, what facilities would be needed, and how much profit could be expected (Schermerhorn & Makus, 1987). In the analysis of environmental conditions, the firm should consider the availability of sites, types of local services, type of government service and transportation services (Schermerhorn & Makus, 1987). The proposed venture has the possibility to be profitable if the factors are analyzed adequately and the researchers determine them to be favorable (Schermerhorn & Makus, 1987).

Feasibility is based on current local assets and other elements of the current local situation. In terms of agriculture, assets include established crops including history of and general knowledge about production practices and product attributes. Also important is the natural resource base including soil and water resources, climate, and flora and fauna. The level of human capital (education and knowledge obtainment of the local population) is important, as is the nature and level of development of social capital (i.e., the form of social connections between groups and individuals) (Schultz, 1961). Both human capital and social capital are very important in determining the ability of a community to formulate goals and implement strategies to meet goals. Also important is the level of physical infrastructure including available water and sewer systems, the set of roads,

railroads, and other transportation systems, housing stock, and commercial buildings and developable sites. Also key is the access the community has to sources of input supply and especially product output markets. As previously emphasized, remoteness from large urban markets can limit marked-based opportunities for rural communities.

Saluda County Research Project

The following is a description and summary of an agribusiness strategic plan for Saluda County by Hughes, Swindall, Macdonald, & Purcell (2012), which this thesis builds upon. “The main purpose of the report is to develop the Saluda County Strategic Plan for developing value-added processing of local agricultural products. The ultimate goal is assisting the economic development leadership of Saluda County in using agribusiness as a means of raising productivity and per capita income, generating employment opportunities, and increasing the size of the local tax base” (Hughes, Swindall, Macdonald, & Purcell, 2012, p. 2).

The agribusiness sector includes the production, processing, distribution and retailing of agricultural crops, livestock, fisheries and forest products. The researchers included a six-county region (Aiken, Edgefield, Greenwood, Lexington, Newberry, and Saluda) as the area region of study. The region is based on the presumption that an agribusiness-based

processing facility in Saluda would be able to draw inputs from this area (Hughes, Swindall, Macdonald, & Purcell, 2012).

After reviewing the secondary data, the researchers compiled an asset inventory (or mapping) of Saluda County. “Overall, Saluda County and the region have strong assets that suggest that there is great opportunity for economic development, particularly in the agribusiness and food processing sectors. The state of South Carolina is second among the nation in terms of peach production, while Saluda County is ranked first among the counties in the state. Further, neighboring county Edgefield is second in the state in terms of peach production. Saluda has interstate access to the third ranking state in the nation in Georgia. Saluda County’s brain drain can account for some of the aging population characteristics; however, the strong percentage of young adults from Saluda County who are leaving the area to attain higher education can also be viewed as a strength and opportunity. There is also a strong percentage of the population who are commuting to other counties for good paying jobs. Per capita income in the county has continued to rise relative to the region, state, and the nation, and the population has increased dramatically in the past decade. Both of these factors could be driven by the strong quality of life found in Saluda County. The county also has several high potential, already developed industrial buildings along with an industrial site with rail access. Given the factors of the agriculture cluster, a growing population base with strong education, the good quality of life, and industrial sites, Saluda County is positioned for

strong growth in the food processing and manufacturing sectors" (Hughes, Swindall, Macdonald, & Purcell, 2012, p. 19-20).

A phone survey was developed to assess the broader agribusiness community and obtain opinions about strengths, assets, and challenges of agribusiness in Saluda County and ideas about potential agribusiness opportunities. With regard to the assets in Saluda County, responders most commonly valued the existing agriculture industries in peaches, poultry, row crops and livestock and also the natural resources in the county. With regard to using the assets in the county to generate new opportunities, many responders believed that existing agriculture industries could be expanded, specifically the existing poultry, peach and livestock industries. Many also believed that agritourism could be expanded in the area, using the existing agriculture. Another common suggestion was to develop value-added or niche products, with one responder suggesting value-added products for peach waste. As far as specific ideas for agribusinesses in Saluda County, the most common response was roadside/farmer's markets followed by the responses of more locally grown products produced and cattle born, raised and slaughtered in the county. The other common response was value-added products from peaches. Finally, a less common but potentially viable suggestion was the development of a value-added timber industry. As far as challenges the county might face with developing the agribusiness ideas, the most common response was high start-up costs, followed by the response that many young people leave the county to pursue other jobs (Hughes, Swindall, Macdonald, & Purcell, 2012).

The researchers also conducted a focus group where the results of the data gathering effort and surveys were presented to the public with an emphasis on the broader agribusiness community. In particular, respondents liked the idea of a fruit or nut processing plant because it could build off of existing fruit industries in the area, such as the peach industry. Both the ideas of a canning facility and a distillery were positively received. Respondents also liked the secondary timber processing plant and co-packer and shared-use industries and felt that they could be successful in the area. The co-packer and shared-use facilities were viewed as appropriate ways to add value to already established agriculture industries. The slaughterhouse, farmer's markets and agritourism ideas were met with more of a mixed response. The concerns about the farmer's markets and agritourism were that they would likely only benefit smaller farmers (as opposed to larger operations) unless they were done on a very large scale. Also, these industries are unlikely to generate a large number of new jobs or large increase in the tax base. The issues expressed with the slaughterhouse were that it would generate a few jobs, but they could be unpleasant and low paying. Also, there could be too much competition from other nearby slaughterhouses, such as the one in Greenwood, for it to be successful (Hughes, Swindall, Macdonald, & Purcell, 2012).

"The research team compiled the Strengths, Weaknesses, Opportunities, and Threats (SWOT), based on preliminary data analysis, interview results, and focus group feedback. The results of this analysis are compiled with equal weight between the

community input and the research team's expertise" (Hughes, Swindall, Macdonald, & Purcell, 2012, p. 24).

The strengths in Saluda County were identified as established agriculture infrastructure, community support towards agriculture and agribusinesses, fertile soil, concentration of fruit production and poultry processing, quality of life in the area, a move-in ready industrial complex, and proximity to large population centers that provide a market for agritourism, final products and workforce (Hughes, Swindall, Macdonald, & Purcell, 2012). A weakness in Saluda County was identified as low property tax base available to the local government due to the large amount of agriculture, which hampers the government when attempting to provide additional services for businesses and residents as well as developing an industrial base. Further, there is a lack of entrepreneurship in Saluda County, perhaps because of the lack of small business resources (Hughes, Swindall, Macdonald, & Purcell, 2012).

The identified opportunities in the county are the possibility to process fruits and vegetables, and agritourism. Currently, there is very little processing of fruits and vegetables. Also, with the increasing interest in local foods and the growth of the Columbia Metropolitan area and weekend residents on Lake Murray, there are opportunities to bring in tax dollars through agritourism (Hughes, Swindall, Macdonald, & Purcell, 2012).

The SWOT analysis also included, or course, challenges or threats including the brain drain, which is the current most important threat. “If Saluda cannot find a solution to attract and retain educated residents, growth in high income, permanent year long jobs may be difficult to come by” (Hughes, Swindall, Macdonald, & Purcell, 2012, p. 25).

In the final analysis, Hughes, Swindall, Macdonald, & Purcell explored several potential value-added agribusiness processing activities including their feasibility and potential for promoting economic development in Saluda County. Evaluated industries were a livestock processing facility, fresh cut fruit processor (possibly a co-packer), a canning facility, a packing shed (possibly a co-packer), a brandy distillery, a winery, and a wood and paper products business of some type. Each of the proposed activities had its strengths and weaknesses although the fresh cut fruit processor was determined to be the most promising of the evaluated industries.

CHAPTER III

FEASIBILITY OF A FRESH FRUIT AND VEGETABLE PROCESSOR

Introduction

Before establishing a new business, a feasibility study should be conducted to determine financial viability. Feasibility studies project business' profitability based on the consideration of estimated costs as compared to estimated revenues. Based on the existing agriculture base, community responses and market trends, a co-packer is a potentially profitable business that could add value to products grown in Saluda County. Evaluated here is the feasibility of a fresh fruit and vegetable processor co-packer in Saluda County.

Community Response

As discussed in Chapter II, a previous study by Hughes, Swindall, Macdonald, & Purcell provides an agribusiness based asset mapping of Saluda County including perceptions held by agribusiness leaders in the county. Nearly 60% of the interviewed respondents believed that well-developed, existing agriculture industries such as peaches, poultry, row crops, and livestock, are important county assets. Many indicated that those industries could serve as a base on which to grow new value-added agribusiness opportunities.

Several people also believed that the existing infrastructure, including good retail distribution and well-developed supporting industries, is an asset that could support growth (Hughes, Swindall, Macdonald, & Purcell, 2012).

While no survey respondent mentioned the term “co-packer,” 20% of all survey respondents expressed the desire to add value to the products that are already being produced in Saluda County. Survey respondents were asked to indicate specific types of local valued-added agriculture that should be developed. Among responders, 13% mentioned that they would like to see value-added products made from waste peaches. Specifically, peach butter, purees, juice, biofuels, and consumable alcohol were all mentioned at least once as possible products (Hughes, Swindall, Macdonald, & Purcell, 2012).

In focus group from the Hughes, Swindall, Macdonald, & Purcell study, attendants were specifically asked to react to the idea of establishing a co-packer in Saluda County. The reactions were positive. Participants said that a processing plant could be used to produce fresh cut fruit or can preserves, jellies, jams or even baby food. Attendants also observed that agriculture producers that currently outsource their fruit processing to other locations could use a local co-packer, which would keep more money within the county (Hughes, Swindall, Macdonald, & Purcell, 2012).

Fruit and Vegetable Production in Saluda County

There is a large volume of fresh fruit and vegetable production in Saluda County and surrounding counties. Most notable is the peach crop, but Saluda County has a variety of other fruits and vegetables that it produces and the volume is increasing. According to the US Census of Agriculture, from 2002 to 2007, there was a 180% increase in the value of production of vegetables, melons, potatoes and sweet potatoes crops in the Saluda County Region (Lexington, Aiken, Greenwood, Edgefield, and Saluda Counties). The total value of these crops in the Saluda Region was $4,567,000 in 2007 and there were 218 farms of this type (USDA, 2007).

There were a total of 430 reported acres of harvested vegetable and melon crops in Saluda County as of 2007 (see Table 3.1). The crop with the most acres harvested was sweet corn with 13 acres harvested and 8 fresh-market operations with acres harvested (Table 3.1). The total sales for the vegetable and melon crop in the county was $1,491,000.

Table 3.1: Vegetable and Melon Production in Saluda County

	Acres Harvested	Operations with Area Harvested	Fresh-market operations with Acres Harvested	Processing Operations with Acres Harvested	Sales, $
Beans,Snap	1	4	4		
Broccoli		1	1		
Cucumbers		4	4	1	
Melons, Cantaloup	1	3	3		
Melons, Watermelon		2	2		
Okra	4	3	4		
Peas		1	1		
Peppers, Bell		1	1		
Pumpkins		2	2		
Squash		1	1		
Squash, Summer		1	1		
Sweet Corn	13	8	8		
Tomatoes		9	9	1	
Vegetables, Total	430	36	18	1	1,491,000

Source: USDA, 2007 Census of Agriculture

The fruit farm industry includes peach production and has been growing rapidly in the area over recent years and is the largest fruit crop in Saluda County (Table 3.2). In 2007, Saluda County had the most peach production in South Carolina and was the seventh county in the United States in peach production (USDA, 2007). Nearby Edgefield County was the second largest county in South Carolina in peach production and the eighth largest county in the United States (USDA, 2007). Nationally, South Carolina ranks eleventh among all states in fruits, tree nuts and berries production (USDA, 2007).

Further, "Between 2004 and 2009, the real earned income (i.e. inflation-adjusted) for fruit farming grew by an astonishing 9556.6% in the Saluda Region (see Table 3.3). The output location quotient was 1.875 in 2009, which means that the Saluda Region had a markedly large concentration of fruit farming as compared to the United States as a whole" (Hughes, Swindall, Macdonald, & Purcell, 2012, p. 44).

Table 3.2: Fruit Production in Saluda County

	Total Acres	Operations with Area in Production	Operations with Area Harvested	Sales, $	Operations with Area Non-Bearing	Operations with Area Bearing
Apples					2	3
Blueberries			7			
Figs						2
Fruit & Tree nut total				3,801,000		
Grapes						2
Nectarines						1
Non-Citrus Totals	4,776				9	10
Orchard Total	5,162					
Peaches	4,761				8	10
Pears	2				1	4
Plums & Prunes						3
Strawberries			3			

Source: USDA, 2007 Census of Agriculture

Table 3.3: Fruit Farming in Saluda Region

Industry	US Real Earnings Growth (2004-2009)(%)	Region Real Earnings Growth (2004-2009)(%)	Output Location Quotient	Total Employment (2009)	US Earnings per Worker (2009)	Region Earnings per Worker (2009)
Fruit Farming	393.9%	9556.6%	1.875	559	23,003	9,429

Source: Hughes, Swindall, Macdonald & Purcell, 2012

Peaches are a vital part of the agriculture in the Saluda region and the county. According to the agriculture census, the fruits, tree nuts and berries industry in the Saluda Region, which also includes peaches, was valued at $6.4 million in 2007. There were 203 farms of this type in the Saluda Region (USDA, 2007). Further, peach production has increased markedly since 2007. Out of the top 25 stone fruit producers in 2012 in the United States, three were located in Saluda County: Titan Farms, which ranked third, JW Yonce and Sons, which ranked tenth, and Dixie Belle Orchards, which ranked thirteenth (American Western Fruit Growers, 2012). Titan Farms had 5,040 acres in peach product, JW Yonce and Sons had 3,200 acres in peach product and Dixie Belle Orchards had 2,500 acres in peach product (American Western Fruit Growers, 2012).

Relevant Agricultural Processors near Saluda County

There are a variety of agricultural products to which a co-packer in Saluda County could add value. Examples of successful nearby farms (all within 200 miles of Saluda County) that add value to their own production include Lane Southern Orchards and WP Rawl Farms. Hillside Orchard Farms adds value to production for other farms, making it a true co-packer. At least one of the large farms in Saluda County uses Hillside Orchard Farms to add value to its produce.

Hillside Orchard Farms is in Tiger, Georgia in Rabun County (130 miles from Saluda County), is owned by Robert Mitcham and was established in 1983 (Reference USA, 2011). Hillside Orchard Farms retails farm produce and products and is a processer of over 600 products in small batches including jellies, jams, preserves, fruit and vegetable butter, fruit syrups and fruit spreads. They also have a retail store on the premise and ship products from an online store. Hillside Orchard Farms has 25 employees and estimated sales of $5,550,000 in 2011 (Reference USA, 2011).

Lane Southern Orchards is located in Fort Valley, GA in Peach County (180 miles from Saluda County) and was established in 1908 (Reference USA, 2012). Lane Southern Orchards grows and ships a variety of pecans, strawberries and peaches (Lane Southern Orchards Website, 2012). It grows more than 25 varieties of fruit on over 2,500 acres. A packing and processing plant adds value to its own crops in producing jams, jellies, pecan

pies, oils and syrups. Packaged products and fresh fruit and nuts are sold on an online retail store. An on premise café features foods grown and processed on the farm such as pecan pie. Lane Southern Orchards employs 200 people and has estimated sales of $17,600,000 in 2011 (Reference USA, 2012). Lane Southern Orchards only processes crops from its own farm.

Along the same lines as Lane Southern Orchard, WP Rawl farms also processes the produce it grows. Established in 1936, WP Rawl farms is located in Pelion, SC (40 miles from the town of Saluda) in Lexington County, SC. WP Rawl farms produces a variety of fresh vegetables ranging from greens to herbs to peppers and corn (WP Rawl Webpage, 2010). It has over 400 employees and has estimated total sales of $57,619,461 (Dun & Bradstreet Credibility Corporation, 2012). Instead of adding value to its products by turning them into canned goods like Lane Southern Orchards, WP Rawl farms focuses on bagging and packaging fresh produce. Some of its value-added products include packages of individual servings of fresh fruit and vegetables and bagged lettuce and fresh cut vegetables sold in clamshell packages. Clamshell packages are clear, plastic containers that have two hinged sides that are commonly used for packaging fresh produce. WP Rawl is not a co-packer but adds value to the products that it grows: however, it could still serve as a model for a co-packer in Saluda County given its success and proximity.

Fresh Cut Fruit and Vegetables

Saluda County leadership could consider a co-packer that produces fresh cut produce. Fresh cut produce is defined as any fresh fruit or vegetable that has been changed from its original form to create a 100% usable product that is prepackaged and includes a variety of items, such as bagged salads, baby carrots and fresh cut apples (Mayen & Marshall, 2005). Its popularity continues to increase due to increasing demand for healthy and convenient foods.

Fresh cut produce sales are improving and are important to retailers because fresh cut produce makes up a large portion of grocery sales (Fresh Cut Magazine, 2011a). In 2010, there were a total of 7,066 companies that did wholesale distribution of fresh fruits and vegetables (Pearce, 2012a). In 2010, the fresh fruits and vegetables industry generated $28 billion in total sales and employed 96,140 people (Pearce, 2012a). Sales of fresh fruits and vegetables have increased significantly in recent years in the United States largely due to nutritional awareness and government promotion of eating more fresh produce (Pearce, 2012a).

Packaging is an important part of selling and distributing fresh fruits and vegetables. Clamshell-packed items have the highest dollar sales (68% of sales in 2011), followed by other packing methods, such as tubs, jars, shrink-wrap (29% of sales) and bags (less than 3% of sales in 2011) (Fresh Cut Magazine, 2011a). Bagged salad is its own category and

makes up the largest volume of sales (Fresh Cut Magazine, 2011a). Fresh-cut produce purchased with clamshells sales increased almost 3% between 2009 and 2010 (Fresh Cut Magazine, 2011a).

Due to the large volume of fruit growth in the area, a co-packer that processes fruit into fresh cut fruit could be viable in Saluda County. A study in Indiana recommends a fresh cut fruit enterprise for melon growers as a way to add value to their products, thus enhancing the economic stability of melon farming by focusing on final consumers (Mayen & Marshall, 2005). One potential constraint, which also applies to Saluda County for a variety of crops, is the fact that melon growing is seasonal. To keep the fresh cut industry from having to shut down for the majority of the year, the authors suggest potentially partnering with another produce industry, which has a different growing season (Mayen & Marshall, 2005). A fresh cut co-packing operation should be able to process different types of fruits and vegetables so that it will not be constrained by one specific harvest season. Or alternatively, use the same facility for a different type of processing like canning. For example, it could process summer harvests during the summer and process winter vegetables, such as broccoli, when they are in season.

By extension, a fresh-cut co-packing industry could eventually be considered as an option for Saluda County. Traditionally, the problem with selling packaged fresh-cut peaches was that they generally oxidize quickly and have a short shelf life (Fresh Plaza, 2010). However, recent advanced technology in cultivars, packaging and processing has made it

possible to store fresh-cut peaches for up to 15 days without browning, fermentation and rot (Fresh Plaza, 2010). This new technology could help put fresh-cut peaches in the same category of healthy, ready-to-eat snacks as cut apples and melons (Fresh Cut Magazine, 2008). Another benefit of fresh-cut peaches is smaller fruit than what consumers will accept for fresh eating is acceptable in the form of peach slices (Fresh Cut Magazine, 2008).

This technology has recently been adopted by Titan Farms (Fresh Cut Magazine, 2011b). In August 2011, Titan Farms began selling packaged fresh cut peaches and nectarines to test markets. The fruit was sold in 2 and 10-ounce packages with a shelf life of 14 days. The response from consumers about the 8-week run was positive. Chalmers Carr, CEO of Titan Farms, stated that he believed that within 2-4 years fresh cut peach slices will be available in most produce departments (Fresh Cut Magazine, 2011b). He said that the slices could be available for two seasons out of the year (9 months) given sufficient demand (Fresh Cut Magazine, 2011b). However, a fresh-cut peach operation is outside of the scope of this study because the technology is in a beginning phase and estimates of equipment are not publically available.

Frozen Fruits and Vegetables

Another way a co-packer could add value to fruits and vegetables is freezing. Freezing produce greatly extends the product life. Lowering the temperature of food decreases the

speed of chemical and physical reactions that result in spoilage (Pearce, 2012b). Most fruit and vegetables are quick frozen within hours of being harvested, which helps preserve their nutritional value (Pearce, 2012b). In 1998, the US Food and Drug Administration declared that frozen fruits and vegetables are as beneficial to health as fresh fruits and vegetables (Pearce, 2012b). Many retail and institutional buyers like to buy products year-round, which creates a supply problem during the off-season. Freezing produce is a way for a facility to deal with demand for produce on the off-season.

Sales of frozen fruits, fruit juices and vegetables were $9.58 billion in 2005, up from $8.66 billion in 2002, a 10% increase (Pearce, 2012b). In 2005, frozen vegetables had revenue of $6.9 billion and frozen fruits and juices had revenue of $2.3 billion (Pearce, 2012b). Consumers generally receive frozen fruits, fruit juices and vegetables through two possible outlets: grocery stores (retail) and food service (Pearce, 2012b). At the retail level, in 2008, sales of frozen fruits and vegetables were $3.6 billion (Specialty Food Magazine, 2011). This number grew by 3.5% between 2008 and 2011 to $3.8 billion and made up 1.5% of retail sales of all food in 2011 (Specialty Food Magazine, 2011). In the specialty foods category, frozen fruits and vegetables grew by 11.9% between 2008 and 2011 (Specialty Food Magazine, 2011).

Regardless of the type of processor that Saluda County leaders might opt to implement, certain facts should be considered. First, the facility should be able to process more than one type of produce to maintain production throughout the year. Greater volume

enhances the likelihood of financial viability and processing through several harvest seasons is a way to increase volume (Mayen & Marshall, 2005). Most importantly, a sufficient number of producers must commit to provide their crop as input for a processor (co-packing or otherwise). These growers must also be willing to provide crops that are sufficiently high in quality to warrant further value-added activities, by, for example, meeting US Department of Agriculture grade standards or by being produced using Good Agricultural Practices (GAP). Another consideration is to make sure that there is a sufficient market for processed products. For example, one major producer has 20% of its peach crop available for processing, but less than one percent is actually processed (in this case converted into jarred products) due to insufficient demand (Watson, 2012). One way to insure that the product is purchased is to try to secure forward market contracts (that specific future product delivery and payment), such as contracts with public schools (Watson, 2012). Finally, because there is such a large volume of peaches in Saluda County, it would be ideal for the processor in question to be able to process peaches in some form.

Based on these suggestions, secondary data research and community input, a specific, possibly viable co-packing option that should be evaluated for feasibility is a co-packer that produces frozen, bagged peaches during peach season and cut, bagged vegetables (fresh and/or frozen) when peaches are not in season. Adding value to peaches was very important to the community members surveyed in part because peaches have a large role

in the local economy. Utilizing the space when peaches are not in season to process other vegetables will maximize the efficiency of the space and enhance viability.

As shown in Table 3.4, vegetables that are grown in the spring, fall and winter in the region and could be processed at the co-packing facility during the peach off-season. The crops with the most acres harvested are collard and turnip greens, which have harvest seasons that extend into the winter months (USDA, 2007) (see Table 3.4 and Table 3.5). All of the collard and turnip green acres harvested are from Lexington County (USDA, 2007). Out of the vegetables in the table, snap beans, broccoli, and peas are the most commonly sold in fresh cut or frozen form. Beets, green onions, radishes and sweet potatoes are more commonly sold in their whole form. The snap bean harvest season extends from May to October, the green pea harvest season extends from May through December and the broccoli harvest season extends from October to December (Table 3.5). Selecting snap beans, broccoli and green peas as inputs extends the processing time beyond the end of the peach growing season (August) into the end of December (that is, the facility would be expected to operate for eight months on an annual basis) (Table 3.4).

Table 3.4: Harvest Season of Select South Carolina Produce

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Peaches												
Beans, Snap												
Beets												
Broccoli												
Greens, Collard												
Greens, Kale												
Greens, Mustard												
Greens, Turnip												
Onions, Green												
Peas, Green												
Peppers, Bell												
Radishes												

Note: cross-hatching indicates months where these vegetables could provide inputs in lieu of peaches.

Source: SC Department of Agriculture

Table 3.5: Spring, Fall and Winter Vegetables in Saluda Region

	Total Acres Harvested	Operations with Acres Harvested	Fresh-Market Operations with Acres Harvested	Processing Operations with Acres Harvested
Beans, Snap	27	71	64	10
Beets	n/a	3	2	0
Broccoli	n/a	5	5	0
Greens, Collard	1975	23	23	0
Greens, Kale	n/a	4	4	0
Greens, Mustard	n/a	9	9	0
Greens, Turnip	1162	11	11	0
Onions, Green	n/a	7	7	0
Peas, Green	56	31	31	0
Peppers, Bell	n/a	16	14	0
Radishes	n/a	1	1	0

Source: USDA, Census of Agriculture, 2007

Facility and Equipment Needs

Each processing facility is unique because of differences in individual factors such as production type, scale, production and output markets. The focus of this processing facility is on local produce, specifically peaches and vegetables, selling to regional institutional and retail buyers. Most of the production process, facility, equipment and labor needs of this study are based off a similar feasibility study for a fresh-cut produce processing facility in Madison, Wisconsin (Boyd, 2004). The study was conducted in 2004 so the costs were converted into 2011 dollars by using the appropriate Producer Price Index (for example, the equipment costs were put into Producer Price Index category of frozen fruit and vegetable manufacturing). Other costs, including the insurance costs and office equipment costs, were based on a feasibility study for a regional shared use food and agriculture processing facility (Wold, 2005). Costs were also converted into 2011 dollars using the appropriate Producer Price Index. Most fresh-cut facilities generate a minimum of 800 pounds per hour to offset the necessary large capital investment (Boyd, 2004). Most suppliers only offer equipment that is designed to process at least 800 pounds per hour (Boyd, 2004). The approximate size range for a facility with this level of production is 15,000 to 20,000 square feet (Boyd, 2004).

Production Process

There are several steps required to process fresh fruits and vegetables into their final stage. First, the produce is prepared for processing. This stage includes delivering the whole produce to the production line, peeling the produce if necessary, preparing the produce by hand if necessary, and disposing of waste. Waste is an inevitable by-product of a fresh-cut industry. There are several options for disposing of the waste: it can be incinerated, put in a landfill, composted, or used as livestock feed (Boyd, 2004). In the second stage, produce is cut by machine. Thirdly, the produce is washed to remove any contaminants and dried. In the fourth stage, which is optional, the produce can be blanched and frozen. An individual quick freeze tunnel freezer is recommended for this step because it keeps the individual pieces from sticking together in the final product. In the fifth and final stage, the produce is packed and sealed into plastic bags.

Buyers and Outlets

It is also important to consider who would purchase co-packer products. It would be ideal to establish forward market contracts before the processor is established to assure that there is sufficient demand. Two possible outlets are institutional buyers and retail buyers. Institutional buyers could include hospitals, nursing homes, schools and colleges.

Schools in the county are one possible buyer products. There are three elementary schools, a high school and a middle school in the county. One possible way to link the outputs from the co-packer with local schools is the Farm to School program. The Farm to School program connects schools with local farms to promote healthy nutrition, agriculture and nutrition education and support local and regional farmers (The National Farm to School Network, 2012). In South Carolina, 52 schools and childcare centers are currently involved in the farm to school program. Although no schools or childcare centers are involved with the farm to school program in Saluda County, eight K-12 schools and childcare centers are involved in Lexington and Newberry Counties (The National Farm to School Network, 2012). There are also several institutions of higher education in and nearby Saluda County, including University of South Carolina, Aiken (35 miles away), University of South Carolina, Columbia (45 miles away), and the Saluda campuses of Piedmont Technical College and Midlands Technical College, which all could be potential buyers.

There are no hospitals in Saluda County, but there are several in the surrounding counties that could be potential buyers for the processor's outputs. Lexington County has the most and largest hospitals in the area, including G. Werber Bryan Psychiatric Hospital (50 miles away), Lexington Medical Center (40 miles away), Moncrief Army Community Hospital (57 miles away) and Providence Hospital (50 miles away). Also nearby are Edgefield County Hospital (23 miles away), Aiken Regional Medical Center (30 miles away), and Self Regional Healthcare in Greenwood (28 miles away). Three local nursing

home and assisted living facilities in Saluda County could be potential markets (Long's Residential Care Center, L & B Care Home, and Saluda Nursing Center).

Regional retailers are also potential buyers for the outputs of the co-packer. There is a growing movement for grocery stores and big box chains to sell locally grown products, due to increasing customer demand for such products. For example, BI-LO, a grocery store chain based out of Mauldin, South Carolina, purchases some of its produce from South Carolina farmers, including from Walter P. Rawl & Sons, which is based out of Pelion, Lexington County (BI-LO Markets, 2012). Some of the most popular Walter P. Rawl & Sons products sold at BI-LO markets are triple-washed, cut and bagged leafy greens and pre-cleaned and diced Versatile Veggies (BI-LO Markets, 2012).

Another way that the co-packer could sell its product would be to have a retail outlet on premise where community members or tourists could buy the fresh or frozen fruits and vegetables directly. This retail outlet could be tied in with agritourism where consumers could visit and tour the facility, observing the methods of production before purchasing the product.

Costs

Facility and Land

A typical fresh-cut facility has the following components: receiving area and cold storage, production room, finished product storage (including a freezer), maintenance shop and office and employee areas (Boyd, 2004). For the purpose of this study, it is assumed that the size of the facility is 15,000 square feet, which is sufficient for a production volume of 800 pounds per hour. The estimated cost for the facility is $114.13 per square foot, and the total cost of construction for the facility is $1,711,875. It is assumed that the building will be a new construction (not a retrofitted existing building). Finally, because the co-packer would be an asset to the community, it is assumed that Saluda County will donate the land necessary for free.[1]

Equipment

A variety of equipment is needed to transform fresh produce into a value-added, finished product (Table 3.6). The equipment needs are discussed as a five stage transformation process. In the first stage, fruits and vegetables are prepared for processing. A peeler, bin

[1] Saluda County leadership should consider the opportunity cost of the land. The opportunity cost is other viable uses for the land that could promote economic development.

dumper (to move product from storage to the metering belt), metering belt (insures a steady flow to the trim station), and trim station are required (Boyd, 2004). In the second stage, fruits and vegetables are cut and sliced. Two cutting machines are recommended, both made by Urshel Manufacturing, a leading equipment manufacturer. Cutting machines are often the most expensive item on a processing line and careful consideration should be given to their purchase (Boyd, 2004). The two machines will enable a versatile set of products as both machines can be used on an assortment of vegetables including peaches, broccoli, green beans, cabbage, carrots, lettuce and onions with a variety of different types of cuts, including slicing and dicing. The first machine, Urschel Model G-A, produces flat dices and slices for a variety of produce, including broccoli, peppers, potatoes, and cabbage. The second machine, Urschel Model TranSlicer2000, slices leafy vegetables up to 6 inches in diameter and firm fruits and vegetables up to 4 inches in diameter, including peaches. In the third stage, fruits and vegetables are washed and dried. A flume system, for lighter vegetables, and a spray system, for heavier vegetables, are recommended, as well as a water treatment system (Boyd, 2004). A centrifuge dryer is recommended for drying (Boyd, 2004). In the forth stage, the produce is blanched and frozen. This is the most expensive step because of the storage costs and the equipment needed. A blanching system, cooling system (to cool the product after blanching to reduce freezer load), individual quick freeze tunnel freezer, and refrigeration system are necessary for this step (Boyd, 2004). For fifth step, packing and sealing, a packing table, pre-seal bag conveyor, bagging machines, rotary packing table and taping machine are required (Boyd, 2004).

Office equipment, including telephone system, computer system and office furniture would also be needed for administrative purposes. Based on a facility of 15,000 square feet, it is estimated that the cost of such equipment would be $16,167 (Wold, 2005). It is assumed that the equipment will need to be replaced every twelve years (Boyd, 2004).

Labor

Another important component of processing is the labor required for running the facility. Based on a production level of 800 pounds per hour, it is estimated that 13 production line employees are needed whenever the production line is running (see Table 3.7) (Boyd, 2004). These 13 production line employees could be hourly workers and the total cost of their labor would vary with hours of operation. The national median hourly wage for food and tobacco roasting, baking and drying machine operators and tenders is $13.26 per hour (Bureau of Labor Statistics, 2011a). Also needed to run the facility is a production manager, who will likely be salaried (Boyd, 2004). According to the Bureau of Labor Statistics, in South Carolina, the median salary for a first line supervisor of production and operating workers is $58,130. A bookkeeper/accounting clerk is needed for clerical work. This position is assumed to be contracted out through an external firm. The estimated cost for this position is $33,540 per year (Bureau of Labor Statistics, 2011b).

Table 3.6: Summary of Production Equipment Costs (800 pounds per hour)

Process	Equipment	Cost
Product Preparation	Peeler	$24,380
	Bin Dumper	$23,545
	Metering Belt	$22,291
	Trim Station	$39,009
Cutting Machine	Urschel Model G-A	$73,838
	Urschel Model TS2000	$73,838
	Additional Parts	$7,523
Wash System	Flume System	$83,590
	Basket Washer	$27,167
	Water Treatment System	$16,718
Drying	Centrifuge Dryer	$11,145
Blanching and Freezing	Blanching System	$112,847
	Cooling System for Blancher	$87,770
	IQF Tunnel Freezer	$271,668
	Freezer Storage System	$208,975

Table 3.6 (Continued)

Packing and Sealing	Packing Table	$17,415
	Pre-Seal Bag Conveyor	$15,325
	Bagging Machines (3)	$52,244
	Bag Conveyor and Metal Detector	$39,009
	Rotary Packing Table	$8,359
	Taping Machine	$10,449
Total Cost		$1,227,102

Source: Yellow Wood Associates, David Boyd, 2004

Table 3.7: Labor Requirements for Production Line by Process (800 pounds per hour)

Process	Number of Persons
Trim Line (hand preparation)	3
Cutting	0 (automatic feed)
Drying	2
Blanching and Freezing	2
Packing	2
Bag Sealing	2
Finished Packing	2
Total Persons Required	13

Source: Yellow Wood Associates, David Boyd, 2004

Property Tax and Interest

Other costs to be considered are tax, depreciation and interest. Based on a property tax rate of 10.5% for South Carolina manufacturing and utility companies and a millage rate of 0.1346 for Saluda County, property tax owed each year on the equipment and facility would be $41,536 (SC Department of Revenue, 2011).[1] Interest costs also need to be

[1] To clarify, concerning the role of the millage rate in calculating property taxes, according to the South Carolina Department of Revenue (2011, p. 74),"Each class of property is assessed at a ratio unique to that type of property. The assessment ratio is applied to the market value of the property to determine the assessed value of the

factored in when computing costs. It is assumed that the capital costs have a 7.59% interest rate (Businessweek, 2012).

Production Overhead and Insurance

Production overhead is another cost item. In this case, production overhead would include sanitation costs, maintenance and parts, laundry costs, utilities, and waste handling costs, all normal costs when running this type of business. The total cost of production overhead for this facility is assumed to be $78,380 annually (Boyd, 2004). Insurance is also required. It is assumed that the annual cost of insurance will be $9,202 (Wold, 2005).

Inputs

A major cost item will be the primary fresh produce. According to the USDA, the price received for processing peaches is $274 per ton in 2011, or $0.14 per pound. The specific vegetables that will be processed during the peach offseason are unknown. Accordingly, an evenly-weighted (straight) average of snap beans, broccoli and green pea prices, all

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property. Each county, municipality or other taxing entity then applies its millage rate to the assessed value to determine the tax due. A mill is a unit of monetary value, equal to one-tenth of a cent, or one-thousandth of a dollar (.001)."

possible vegetable inputs, was calculated based on USDA data for 2011. The average price received per pound of these vegetables is $0.25 (Table 3.8).

Table 3.8: Input Cost of Select Vegetables

Vegetable	Price/lb
Beans, Snap	$0.12
Broccoli	$0.43
Peas, Green	$0.20
Vegetable Average	$0.25

Source: US Department of Agriculture, 2011

The estimated costs of the inputs are dependent on the volume needed, which is dependent on the estimated output. It is assumed that the facility will produce 800 pounds per hour, 40 hours a week, starting in mid-May with the beginning of the peach harvest, and ending in mid-December with the end of the winter vegetable harvest. The peach season runs from mid-May to mid-August. It is assumed that with the length of this season (12 weeks) at the proposed rate of production, the facility will process 384,000 pounds per year of peaches. Winter and fall vegetables can be processed starting at the end of the peach season and run until mid-December. It is assumed that with the length of this season (16 weeks) at the proposed rate of production, the facility will process 512,000 pounds per year of fall and winter vegetables.

Because of the waste involved with fresh fruit and vegetable processing, it is assumed that the facility will purchase 20% more in weight of inputs than it will produce in output. Therefore, it will need 460,800 pounds of peach input and 614,400 pounds of vegetable input. At $0.14 per pound, the cost of the peach input will be $64,512 per year. At $0.25 per pound, the cost of the vegetable input will be $143,360 per year. The total cost of these primary inputs will be $207,872. It is assumed that there will be sufficient supply of inputs for this facility. While this is perhaps a strong assumption, the estimated volume needed for peach inputs is a very small percentage of the overall peach crop in Saluda County (less than 0.5% of the total annual peach crop in Saluda County). The average yield of the potential vegetables (snap beans, broccoli and green peas) is 5,166 pounds per acre. A total of 119 fully productive acres are needed to supply the vegetable inputs for the processor. There was a total of 430 acres of vegetables and melons harvested in 2007 in Saluda County (USDA, 2007), so there may be sufficient supply currently in the county.

Revenue and Output

When calculating the amount of revenue the facility will earn each year, several factors must be considered. First, the level of output should be estimated. In this case, as previously discussed, it is estimated that the facility will process 384,000 pounds of

peaches and 512,000 pounds of vegetables and that all of the output will be purchased. For the purpose of this study, it is assumed that both the peaches and vegetables will be frozen, although it is important to note that the vegetables could be sold in their fresh-cut state. Freezing the vegetables allows for storage and possible sale after the harvest season is over.

Prices for Finished Products

The prices received for the output should also be considered. It is assumed that all of the frozen produce output from the co-packer will be USDA Grade A. Prices at local retail outlets are used as the basis for plant-level prices (i.e., the price actually received by the producer) (Table 3.9) (Stewart, 2012). Plant-level prices are used because it is assumed that the buyers for the output would primarily consist of institutions and retail outlets (the output would not be sold directly to consumers by the processor). The average retail price for frozen peaches in fall 2012 was $3 per pound and the average retail price for frozen broccoli, green peas and snap beans was $1.55 per pound. Plant-level prices were estimated by using a margin breakdown for fruit and vegetable canning, pickling and drying (IMPLAN sector 54).[1] Prices received at the retail level for processed fruits and vegetables are comprised by a portion that go to the fruit and vegetable canning, pickling and drying sector, to wholesale, to retail stores, and to various transportation sectors (air,

[1] These IMPLAN values are in turn based on national data observed for this sector.

rail, water and truck).[1] It is assumed that the outputs would be sold within a relatively close radius of production so all transportation would be done by truck (resulting in zero for transportation by air, rail and water). As shown in Table 3.9, the fruit and vegetable canning, pickling and drying industry is estimated to receive 62.8% of the retail-level price for its outputs (i.e. the plant-level price is 62.8% of the retail-level price). Accordingly, the plant-level price received for peach output is estimated to be $1.88 per pound and the price received for vegetable output is $1.22 per pound.

Table 3.9: Division of Price Received for Fruit and Vegetable Canning, Pickling and Drying Products

IMPLAN Sector Number	IMPLAN Sector Name	Value
54	Fruit and vegetable canning- pickling- and drying	0.627563
319	Wholesale trade businesses	0.089830
324	Retail Stores - Food and beverage	0.270846
332	Transport by air	0.000000
333	Transport by rail	0.000000
334	Transport by water	0.000000
335	Transport by truck	0.011741

Source: IMPLAN Group, 2009

[1] This processes is termed as margining in input-output modeling efforts and as retail, wholesale and transportation mark-ups in other types of analyses.

Feasibility

Finally, by comparing the costs and the revenues, it is possible to conclude if the co-packer would be profitable or a money-losing operation (Table 3.10). The revenues and costs for one year of operation are summarized by Table 3.10. The yearly payment for building and equipment was calculated with the assumption that the building and equipment would be purchased in year one and the equipment would be completely replaced in year thirteen both based on a 7.59% interest rate (see Table 3.11). It is assumed that at the end of the 24 year period, the building and all equipment will have zero salvage value. The yearly payment of equipment and building is calculated using the capital recovery method. “The capital recovery amount is the amount of money required at the end of each year to pay interest on the remaining value of the machine and recover the capital lost through depreciation” (Kay, Edwards, & Duffy, 1994, p. 146). This method was used to combine the depreciation, interest and payment on the principle into one value (Kay, Edwards, & Duffy, 1994). Based on the costs estimates and revenue estimates, the operation would be profitable. The estimated profit for one year is $404,115. Costs are broken down over a 24 year period to show when the major costs will occur in Table 3.11.

Table 3.10: Revenue, Costs and Profit per Year

Revenue	**Units**	**Price**	**Quantity**	**Total**
Frozen Peaches	Pounds	$1.88	384,000	$722,953
Frozen Vegetables	Pounds	$1.22	512000	$623,346
Total Revenue				$1,346,298
Operating Costs	**Units**	**Price**	**Quantity**	**Total**
Production line labor	Hours	$13.26	14560	$193,066
Salaried bookkeeper	Dollars	$33,540	1	$33,540
Salaried manager	Dollars	$58,130	1	$58,130
production overhead: sanitation costs, maintenance, laundry costs, utilities	Dollars	$78,380	1	$78,380
Peach Raw Material	Pounds	$0.14	460,800	$64,512
Vegetable Raw Material	Pounds	$0.28	614,400	$172,032
Total Operating Costs				$599,660
Fixed Costs	**Units**			**Total**
Building Payment	Dollars			$143,868
Equipment Payment	Dollars			$147,916
Land Payment	Dollars			$0
Tax and Insurance	Dollars			$50,739
Total Fixed Costs				$342,524
Total Costs				$942,183
Profit				$404,115

Table 3.11: Costs, Revenue and Profit over 24 Year Period

Year	Equipment and Building Costs	Variable (Operational) Costs	Taxes and Insurance	Total Revenue	Net Revenue	Accumulated Net Cash Value
1	$2,955,144	$599,660	$50,739	$0	$(3,605,543)	$(3,605,543)
2	$0	$599,660	$50,739	$1,346,298	$695,900	$(2,909,643)
3	$0	$599,660	$50,739	$1,346,298	$695,900	$(2,213,743)
4	$0	$599,660	$50,739	$1,346,298	$695,900	$(1,517,843)
5	$0	$599,660	$50,739	$1,346,298	$695,900	$(821,944)
6	$0	$599,660	$50,739	$1,346,298	$695,900	$(126,044)
7	$0	$599,660	$50,739	$1,346,298	$695,900	$569,856
8	$0	$599,660	$50,739	$1,346,298	$695,900	$1,265,756
9	$0	$599,660	$50,739	$1,346,298	$695,900	$1,961,655
10	$0	$599,660	$50,739	$1,346,298	$695,900	$2,657,555
11	$0	$599,660	$50,739	$1,346,298	$695,900	$3,353,455
12	$0	$599,660	$50,739	$1,346,298	$695,900	$4,049,355
13	$1,243,269	$599,660	$50,739	$1,346,298	$(547,369)	$3,501,985
14	$0	$599,660	$50,739	$1,346,298	$695,900	$4,197,885
15	$0	$599,660	$50,739	$1,346,298	$695,900	$4,893,785
16	$0	$599,660	$50,739	$1,346,298	$695,900	$5,589,685
17	$0	$599,660	$50,739	$1,346,298	$695,900	$6,285,584
18	$0	$599,660	$50,739	$1,346,298	$695,900	$6,981,484
19	$0	$599,660	$50,739	$1,346,298	$695,900	$7,677,384
20	$0	$599,660	$50,739	$1,346,298	$695,900	$8,373,284
21	$0	$599,660	$50,739	$1,346,298	$695,900	$9,069,183
22	$0	$599,660	$50,739	$1,346,298	$695,900	$9,765,083
23	$0	$599,660	$50,739	$1,346,298	$695,900	$10,460,983
24	$0	$599,660	$50,739	$1,346,298	$695,900	$11,156,883
25	$0	$599,660	$50,739	$1,346,298	$695,900	$11,852,782
		Net Present Value			$3,217,989	
		Internal Rate of Return			18%	

The 24 year period was chosen because it is assumed that the building will be viable for 24 years and the equipment will be replaced one time during the period. It is assumed that the processer would be running at full capacity in year two. Most of the costs are incurred in year one with the building and equipment costs. Because the equipment has a 12 year lifespan, it will need to be purchased again in year 13. It is assumed that at the end of their lifespans, neither the equipment nor the building will have any salvage value.

The net present value and the internal rate of return are calculated (Table 3.11). The net present value is the present value of the total profits and losses of the co-packer over the 24 year period. It is assumed that the discount rate (estimated interest rate) will be 7.59%. The net present value of profits is $3,217,989. In the time period of 24 years, the positive net present value indicates that the facility would be a viable business, based on the assumed costs and revenues. The internal rate of return of a project is the discount rate that makes the net present value from an investment equal to zero. The internal rate of return is 18%. It indicates that the discount rate of the net present value of the profits would have to be 18% or higher for the net present value to not be positive (the discount rate is estimated to be 7.59%). The accumulated net cash value is also calculated (Table 3.11). It shows at which point in time the co-packer would have a positive accumulated cash value (year 7).

Sensitivity Analysis

It is useful to conduct a sensitivity analysis to see if the business would be profitable with different prices for the outputs of peaches and vegetables. Keeping costs constant, output prices can be manipulated to see how they will impact the profits. There are many reasons that the prices for processed fruits and vegetables could decrease, including changes in consumer trends, safety concerns and changes in supply. Based on historical USDA data, it is assumed that the price of processed peaches and the price of processed vegetables are positively correlated (i.e. "move together").

As shown in Table 3.12, variety in output prices greatly impact total revenue and profit. A 20% decrease in output price will decrease the profit, but the facility would still be profitable. A 40% decrease in output prices would cause the facility to be a money-losing operation. The break-even price for outputs is $1.32 per pound for peaches and $0.85 per pound for vegetables, which is a 30% decrease in both set of output prices.

Table 3.12: Profitability and Total Revenue with Output Price Decreases

	20% decrease in output prices	30% decrease in output prices	40% decrease in output prices
Total Revenue	$1,077,038	$942,408	$807,779
Profit	$134,855	$225	-$134,404

Although less likely, it is also possible that the price of one output could decrease independently of the other price. This could happen in the scenario of a food safety scare, such as a product recall for one product. Holding the output price of peaches constant, the breakeven output price of vegetables is $0.43 (35% of its estimated price). Holding the output price of vegetables constant, the breakeven price of peaches is $0.83 (44% of its estimated price).

A sensitivity analysis can also be conducted to see if the processor would still be feasible in the event of rising total costs (Table 3.13). Holding revenue constant, the processor would still be profitable if total costs are increased by up to 43% of the currently estimated total costs.

Table 3.13: Profitability with Increase in Total Costs

	20% increase in total costs	30% increase in total costs	40% increase in total costs	50% increase in total costs
Total Costs	$1,130,620	$1,224,838	$1,319,056	$1,413,275
Profit	$215,678	$121,460	$27,242	$(66,977)

Summary and Conclusions

Discussed here is the financial feasibility of a fresh fruit and vegetable processor. The processor was considered as a possible option for Saluda County based on community responses, available agriculture inputs, and market trends. Retail and institutional buyers were discussed as potential candidates for purchasing the output from the processor. The

output, output prices, and fixed and operational costs were discussed to estimate profitability, internal rate of return and net present value. Finally, a sensitivity analysis was conducted to see if the processor would be profitable with reduced prices for the outputs.

Based on the estimated costs and revenues, it is concluded that the co-packer would be profitable, with a yearly profit of $404,115. Even when the output prices are decreased by up to 30%, the facility would still be a breakeven operation. The net present value of the profits of $3,217,989, and the internal rate of return of 18% are both indicators of profitability.

CHAPTER IV

DESIRABILITY OF A FRESH FRUIT AND VEGETABLE PROCESSOR

Introduction

In addition to the feasibility of a potential value-added agricultural processor, the desirability of that facility should be considered. The desirability of a facility encompasses a wide array of considerations that go beyond financial profitability. It is possible for a facility to be financially feasible but to have an overall negative impact on a community. And alternatively, a facility could fit the requirements of desirability and not be financially feasible (Hughes, 2003). An industry should be both financially feasible and a desirable asset to a community before leadership should pursue it as a means for economic development.

When determining the desirability of an industry, leaders should evaluate employment impacts, pressure on other industries, the impact on the housing stock, environmental impacts and local government impacts (Hughes, 2003). Employment impacts are how a new industry would influence local employment and the types of jobs it would generate. It is important to consider if the jobs generated by a new industry would be desirable to community members. Potentially negative pressure on other industries should be examined. Leaders need to evaluate if a new industry would cause decline in industries already established in the community. The impact on the housing stock is how a new

industry might affect housing prices, either causing the prices to increase or decrease. It is also important to evaluate if a new industry would cause negative environmental impacts in a community. The affect on government services and revenues is also an important consideration. A new industry could put pressure on locally provided public services. A growing population due to a new industry could force local governments to finance new infrastructure like roads and schools (Hughes, 2003). Careful evaluation of all of the aspects of desirability is needed to determine if the positive results of a new industry outweigh any potential problems or issues it could cause. Considering these aspects will help determine if the industry would be an overall asset to the community.

This study will focus on the local economic impact of a co-packer. Local economic impact is an important part of desirability. A new industry can have a direct positive influence on a community's economy, but it can also have indirect and induced impacts. The total impact of a new industry is the total of its direct, indirect and induced impacts. The direct effects are the number of employees and amount of payroll, and level of sales created by the co-packer. The indirect effects are the changes in employment, payroll, and sales caused by the co-packer buying goods and services from other firms in the county. The induced effects are the changes in employment, payroll, and sales caused by the employees of the direct and indirect firms spending their income within the county. In other words, a new industry can have a larger impact on a community than just its direct purchases. To get an accurate sense of the economic impact of a co-packer on Saluda County, all of these impacts should be considered.

Input-Output Analysis

Input-out analysis covers a broad category of models that estimate economic change and are used to describe a local economy (Shaffer, Deller, & Marcouiller, 2004). The input-out approach "characterizes economic activity in a given time period and uses strict assumptions about production and supply-demand equilibriums to predict reaction of a community economy to stimulation resulting from a shock" (Shaffer, Deller, & Marcouiller, 2004, p. 284). These shocks can be from changes in consumption, demand, government policies or changes in production by a given sector (Shaffer, Deller, & Marcouiller, 2004). A useful result from an input-output analysis is the estimation of economic multipliers. Multipliers estimate the effect on the whole economy of the event under study (Hughes, 2003). Multipliers can be used to estimate impacts of a new local industry, policy or investment (Hughes, 2003).

Conducting an input-output analysis requires some important assumptions. One assumption is that the "amount of output produced in a given sector is just equal to the amount of inputs purchased by that sector" (Shaffer, Deller, & Marcouiller, 2004, p. 284). Second, it is assumed that the "industry expansion path is linear and has constant returns to scale" (Shaffer, Deller, & Marcouiller, 2004, p. 284). Finally, it is assumed that "changes in relative factor prices will either not occur or will not affect the proportion of factors used" (Shaffer, Deller, & Marcouiller, 2004, p. 284).

IMPLAN, (Impact Analysis for PLANning) is a “ready-made” input-output modeling software system that can generate useful economic impact estimates (Shaffer, Deller, & Marcouiller, 2004). IMPLAN is commonly used to estimate economic impacts in a local economy including the development of a new industry or business as is the case here. Accordingly, IMPLAN was employed to estimate the local economic impacts of the proposed agribusiness processing facility. The local database used in IMPLAN was Saluda County for the year 2009. The shock represented how the infusion of the co-packing facility’s spending could impact the local economy.

Impact Scenario

Facility expenditures had to be allocated to appropriate IMPLAN sectors to conduct the analysis. Accordingly, each item found in the budget developed for conducting the feasibility analysis was assigned to an IMPLAN sector (Table 4.1), based on knowledge of the local economy, knowledge of the fruit and vegetable processing sectors, on the economic model constructed for Saluda County and on specific industry relationships as found in the U.S. IMPLAN model. One of the largest cost items was production overhead (at $78,380), which included sanitation costs, maintenance, laundry costs and utilities. Production coefficients for the fruit and vegetable canning, pickling and drying products sector (sector 54) in a IMPLAN-based model of the U.S. economy in 2009 were used as a proxy to divide overhead spending into the appropriate IMPLAN industry categories.

Specifically, spending was divided into electric power generation (IMPLAN sector 31), natural gas distribution (32), water, sewage and other treatment and delivery systems (33), maintenance, repair construct of nonresident structures (39), and dry cleaning and laundry services (421). With the exception of dry cleaning and laundry services, coefficients for the national IMPLAN sector of fruit and vegetable canning, pickling and drying products were normalized and used as weights in allocating the $78,380 across the various industries. Dry-cleaning and laundry services was assigned a flat rate of $5,000.

Table 4.1: Division of Production Overhead Costs into IMPLAN Sectors

IMPLAN Sector	Original IMPLAN Coefficient	Normalized Weight	Value
electric power generation	0.0122	0.3648	$26,772
natural gas distribution	0.0161	0.4813	$35,321
water- sewage and other treatment and deliver	0.0006	0.0165	$1,212
maint & repair construct of nonresident structure	0.0046	0.1373	$10,076
dry-cleaning and laundry services	n/a	n/a	$5,000

Source: Calculations based on IMPLAN model 2009

Several of the costs from the budget had no local impact or were not classified as local according to IMPLAN. When an input or cost has no local impact, it is considered leaked. Both the natural gas distribution and water were not considered local based on our economy model and are leaked expenditures. The payment on equipment ($147,916)

is also a leakage because it is assumed that none of the equipment would be manufactured locally. The land has no economic impact on Saluda County because it is assumed that it will be given to the facility by the county so there will be no payments. The property tax ($41,537) is also a leakage based on standard treatment in applications of output-output models. The total of the direct commodity expenditures is $690,988 of which a total of $454,926 (66%) was assumed to be purchased locally and hence have a local economic impact (see Table 4.3).

The infusion of household incomes from the income and profits earned from the facility also were considered in the analysis. As calculated in the feasibility section, it is estimated that the profit of the co-packer will be $404,115 annually. As mentioned in the feasibility section, the estimated revenue was calculated based on the assumption that the co-packer will receive 62.8% of the price received of its outputs. It is assumed that the other 37.2% of the price received from the outputs will be a leakage from the county because the other recipients (wholesale trade businesses, retail stores and transportation by truck companies) are unlikely to be based out of the county. It is assumed that the facility will be locally owned so that the profit earned from the facility will have local impacts. It is assumed that the $404,115 in profit will be split between several owners, and spent as household incomes falling in the $75,000 to $100,000 range.

It is also assumed that the incomes from the production line workers and the manager discussed in the feasibility section will have local impacts. For a co-packer of the

delineated size and production level, there will be 13 production line jobs and one salaried manager. It is assumed that both the manager of the facility and the production line workers will be Saluda County residents. The bookkeeper/accountant is classified as a contractor from an accounting firm. The manager will have a gross salary of $58,130 and the 13 production line laborers will have approximate annual incomes of $15,000 (U.S. Census Bureau, 2010). It is assumed that these salaries will contribute to household incomes falling in the $75,000 to $100,000 range. This is justified because it is assumed that there will be multiple workers in these households that contribute to the total household income. The total of the direct household income infusion including the profit, manager and production line workers' incomes is $655,311 (see Table 4.2).

Taxes

Although the there are no estimated secondary impacts from the property tax paid by the co-packer, it is still necessary to consider the direct value of the property tax. The co-packer will pay an estimated property tax of $41,537 per year. The value of this tax will go to support local infrastructure in the county, including education and fire/police protection.

IMPLAN Results

The economic impact of the co-packer, including both the impact of the commodity purchases (purchased good and services) and the infusion of additional household income (payments to workers and profits), was analyzed in a Saluda County IMPLAN-based economic model. The total impacts of the proposed co-packer are summarized in Table 4.3. The direct, indirect, induced and total impacts on employment, labor income, total value added and output are shown in this table. Employment refers to the number of jobs created, labor income is total employee compensation (pay plus the valuation of certain benefits) plus proprietor income, total value added is the sum of total employee compensation, proprietor income, other property type income, and indirect business taxes and output is the total value of industry production.[1] Table 4.4 shows secondary impacts (indirect and induced) of the co-packer on employment, labor income, total value added and output for select IMPLAN sectors.

[1] Total value added is also a measure of all returns to capital and labor and is equivalent to gross regional product (gross domestic product at the regional level).

Table 4.2: Budget Values Imported into IMPLAN

Title in Budget	Sector Number	IMPLAN Sector	Direct Impact
Vegetable Raw Material	3	Vegetable and melon farming	$64,512
Peach Raw Material	4	Fruit farming	$172,032
Production Overhead	31	Electric power generation- transmission- and distribution	$26,772
Production Overhead[1]	32	Natural gas distribution	$0
Production Overhead[1]	33	Water- sewage and other treatment and deliver	$0
Building Payment	35	Construct new nonresidential manufacturing structures	$143,868
Production Overhead	39	Maintenance and repair construction of nonresidential structures	$10,076
Equipment Payment[1]	213	Other commercial and service industry machinery manufacturing	$0
Insurance	357	Insurance carriers	$9,202
Accounting Firm	368	Accounting, tax preparation, bookkeeping, and payroll services	$33,540
Production Overhead	421	Dry-cleaning and laundry services	$5,000
Tax[2]		Government	$0
Production line labor			$193,066
Salaried manager			$58,130
Profit			$404,115

[1] For these sectors with values set at zero the item in question was assumed to be purchased elsewhere and hence had no local economic impact. As shown in Table 3.10, equipment purchases were a total of $147,916, and as previously discussed in this chapter natural gas distribution was estimated to be $35,321 and water- sewage and other treatment and deliver was estimated to be $1,212.

[2] As is standard in impact analysis, taxes are treated as a leakage with zero impact.

Shock multipliers can also be calculated from the IMPLAN total impacts. Multipliers measure how the income injected into the local economy from the processor is multiplied as it is re-spent locally (Hughes, 2003). Output, or sales by the co-packer, has an estimated multiplier of 1.24, which means $1.24 is generated for every $1 of output spent directly by the processor. Total value added has an estimated multiplier of 1.14, which means that $1.14 is generated for every $1 of total value added spent directly by the processor. The employment output multiplier is 19.2, which means that for every one million dollars directly spent on output by the processor, 19.2 total local jobs are created.

Table 4.3: IMPLAN Total Impacts

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	19.2	$864,709	$884,505	$1,110,237
Indirect Effect	0.3	$8,678	$13,256	$28,832
Induced Effect	1.9	$53,006	$143,164	$232,604
Total Effect	21.3	$926,394	$1,040,925	$1,371,673

Source: Results from Saluda County IMPLAN Model, 2009

Table 4.4: Secondary Impacts of Proposed Co-packer on Selected Sectors

Sector Title	Sector Number	Labor Income	Value Added	Output	Employment
Vegetable and melon farming	3	$85,054	$82,496	$174,502	1.9
Fruit farming	4	$42,625	$35,844	$65,628	0.7
Electric power generation, transmission, and distribution	31	$6,618	$22,689	$30,675	0.1
Construction of new nonresidential manufacturing structures	35	$55,051	$61,493	$143,868	1.5
Wholesale trade businesses	319	$2,554	$4,366	$6,143	0.1
Retail Stores - Motor vehicle and parts	320	$3,875	$4,677	$5,338	0.1
Retail Stores - Food and beverage	324	$4,234	$6,863	$7,842	0.2
Nondepository credit intermediation and related activities	355	$3,459	$8,333	$25,357	0.1
Insurance carriers	357	$2,681	$7,264	$12,256	0.1
Accounting, tax preparation, bookkeeping, and payroll services	368	$17,257	$22,133	$34,291	0.9
Offices of physicians, dentists, and other health practitioners	394	$8,001	$8,531	$15,576	0.1
Food services and drinking places	413	$1,484	$2,114	$5,002	0.1
Dry-cleaning and laundry services	421	$4,757	$5,125	$6,052	0.1
Civic, social, professional, and similar organizations	425	$3,462	$3,494	$7,763	0.2
Other state and local government enterprises	432	$2,728	$2,683	$15,671	0.1

Source: Results from Saluda County IMPLAN Model, 2009

Employment

When analyzing the desirability of a co-packing industry as a form of economic development, it is valuable to consider what kind of employment opportunities it will provide. For maximum economic impact, ideally the job openings would go to Saluda County residents versus non-residents. If the jobs go to Saluda County residents, they will spend more of the income they earn within the community than a non-resident. It is estimated that there will be a total of 21.3 jobs created by the co-packer with the combined direct, indirect and induced employment (Table 4.3).

Along with the direct employees of the co-packer, other jobs will be generated as a result of the indirect and induced impacts of the co-packer. Jobs by selected sectors that are estimated to be generated as secondary impacts from the co-packer are shown in Table 4.4. The sector with most secondary jobs created is vegetable and melon farming (1.9 jobs), followed closely by construction of new nonresidential manufacturing structures (1.5 jobs). Also notable are the jobs created in accounting, tax preparation and bookkeeping sector (0.9 jobs) and the fruit-farming sector (0.7 jobs). These jobs are primarily results of indirect effects of the co-packer, meaning they are jobs created from the co-packer buying goods and services from other firms in the county. Other jobs are created from the induced effects of the co-packer, meaning that they were generated from the infusion of household spending. Examples of jobs created from the induced effects are those in the sectors of office of physicians, dentists, and other health practitioners (0.1

jobs), food services and drinking places (0.1 jobs), and civic, social, professional and similar organizations (0.2 jobs).

Labor Income

The total labor income effect from the shock is $926,394, including direct, indirect and induced effects (Table 4.3). The sector with the greatest labor income impact is vegetable and melon farming ($85,054)(Table 4.4). Other sectors that are greatly impacted are construction of new nonresidential manufacturing structures ($55,051), fruit farming ($42,625) and accounting, tax preparation, bookkeeping and payroll services ($17,257). These sectors are affected primarily due to indirect effects because they are goods and services that the co-packer would purchase. Sectors affected by induced effects are offices of physicians, dentists, and other health practitioners ($8,001), food and beverage retail stores ($4,234) and motor vehicle and parts retail stores ($3,875). These sectors would be impacted by increase in household spending, not primarily by co-packer purchasing goods and services.

Total Value Added

The total value added effect from the shock is $1,040,925 (Table 4.3). The sector with the greatest value added impact is the vegetable and melon farming sector ($82,496) (Table 4.4). Other sectors that are greatly impacted are construction of new nonresidential manufacturing structures ($61,493) and fruit farming ($35,844). The sectors of offices of physicians, dentists and other health practitioners ($8,531), food and beverage retails stores ($4,677) and motor vehicle and parts retail stores ($4,366) are also affected by induced effects.

Output

The total output effect from the shock is $1,371,673 (Table 4.3). The sector with the greatest output impact is vegetable and melon farming ($65,628)(Table 4.4). Other sectors that are markedly impacted include construction of new nonresidential manufacturing structures ($143,868) and fruit farming ($65,628). These sectors are affected primarily due to indirect effects. The sectors of offices of physicians, dentists and other health practitioners ($15,576), other state and local government enterprises ($15,671) and food and beverage retail stores ($7,842) are affected primarily due to induced effects.

Summary

The desirability aspect is an important part of evaluating a proposed industry and the impact the industry would have on the local economy is a valuable part of a desirability analysis. The proposed co-packer would have positive economic impact on Saluda County through direct, indirect and induced effects. The co-packer would have a beneficial impact on employment, labor income, total value added and output in Saluda County. The estimated 21.3 total jobs, $926,394 in total labor income effect, $1,040,925 in total value added effect and $1,371,673 on total output effect are indicators that the proposed co-packer could be a valuable asset to Saluda County's economy. Although not included in the model results, the annual property taxes of $41,537 would still have a beneficial effect on Saluda County's economy, contributing to the county's infrastructure budget.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study is to determine the feasibility of a fresh fruit and vegetable processor co-packer in Saluda County and the economic impacts it would have on the local economy. The processor was selected as a potential business for promoting economic development in Saluda County because of positive community response to the idea, large and growing fruit and vegetable production in the county, lack of fruit and vegetable processing in the county and growing demand for fresh-cut and frozen produce.

The feasibility study was conducted to evaluate if the processor would be a profitable business in Saluda County. The feasibility study was conducted for a co-packer that would produce sliced, frozen, bagged peaches during peach season and cut, frozen, bagged vegetables when peaches are not in season. (A co-packer is a business that manufactures and packages foods for other companies to sell (Rushing, 2012)). It is assumed that the outputs would be sold to retail and institutional buyers. The facility costs were estimated based on a similar study and on the assumptions that the business would process 800 pounds per hour when running in a 15,000 square feet building. The fixed costs, operating costs and revenue were calculated to generate an estimated yearly profit of $404,115. A net present value of $3,217,989 and an internal rate of return of 18% were calculated based on a 24 year period budget. A sensitivity analysis was

conduced which concluded that the break-even price for the peach and vegetable output is 30% below the currently assumed price.

An input-output model of the Saluda County economy (based on an IMPLAN program) was used to estimate the economic impact a co-packer would have on Saluda County. The direct, indirect and induced effects of the co-packer were estimated in terms of employment, labor income, total value added and output. The total effect on employment was 21.3 jobs, the total effect on labor income was $926,394, the total effect on total value added was $1,040,925 and the total effect on output was $1,371,673. Secondary impacts were estimated for employment, labor income, total value added and output for selected IMPLAN sectors. The sector with most secondary jobs created was the vegetable and melon farming sector (1.9 jobs). The sector with the greatest labor income impact was the vegetable and melon farming sector ($85,054). The sector with the greatest value added impact was the vegetable and melon farming sector ($82,496). The sector with the greatest output impact was the vegetable and melon farming sector ($65,628). The indirect versus induced impacts were differentiated for select sectors.

Conclusions

Based on the estimated yearly profit of $404,115, the positive net present value of $3,217,989, the relatively high internal rate of return of 18% and the sensitivity analysis,

it is concluded that the proposed co-packing facility could be profitable. Even when the estimated prices of outputs are decreased by 30%, the facility would still be profitable. As far as desirability, the infusion of spending into the community by the co-packer would have a positive economic impact on Saluda County, providing jobs directly and from secondary impacts.

Recommendations for Further Research

An important consideration before establishing an industry is to confirm the demand for the items manufactured. The potential buyers are mentioned in this study, but no specific buyers were contacted. It is recommended that potential institutional and retail buyers be contacted to establish their demand for fresh cut and frozen produce. This is an important step because it will highlight which products local markets specifically demand. Potential buyers could be interviewed to determine if they would deviate from their current purchasing arrangements to purchase from the proposed processor, and the quantities and types of output they need. If there is not sufficient demand for the products, non-local retail and institutional outlets could be considered as potential buyers.

Further, the supply of inputs for the co-packer should be examined to a greater extent. A sufficient supply of peaches and vegetables are crucial for the functionality of the co-packer. It is necessary to confirm the supply of the inputs before establishing the co-

packer. It is recommended that suppliers like local farmers be contacted to determine that there is sufficient fresh produce input. Particularly important is the willingness of the local farmers to supply the processing facility especially in terms of the required high quality inputs. A limitation of the study is that in calculating the plant-level prices, retail prices for the frozen peaches and vegetables were recorded for only one time period, instead of over several months or several years. In future research, long-term retail prices of frozen vegetables and peaches could be used to estimate revenues and profitability.

Another key consideration is organizational structure. The assumption made here is that the facility would be a privately held co-packing operation. However, a farmer-owned cooperative is an alternative form of ownership. The types of organization structure also have tax implications (for example, corporate income tax rate may need to be considered). Thus organizational and tax implications are both areas of possible future research.

Additionally, the processor's financing should be investigated further. Concessionary loans or grants from USDA's Rural Development Department could be pursued as avenues for financing.

Also, the feasibility of fresh-cut peaches could be further researched. The information regarding the equipment needed for a fresh-cut peach operation is not currently available

to the public, but as this technology becomes more common, the financial feasibility could be researched to see if it could be integrated with the existing co-packing operation.

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