The University of Georgia

Center for Agribusiness and Economic Development

College of Agricultural and Environmental Sciences

Feasibility of a Goat Meat Processing Facility in the Washington County, Georgia Area

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Introduction

The economic feasibility of a goat processing plant in the Sandersville, Georgia area is dependent on a number of factors. Plant possibilities are defined by the availability of market goats (the basic input for goat processing) in a reasonable supply area, along with the number and size of competitors for the available market goat supply. The economics of operating different size plants will determine the potential for a goat processing plant of the size dictated by the available goat production in the area. Community decisions makers will need to know the potential economic impact of a goat processing plant so that they may gauge the benefits of any infrastructure investment required to facilitate a new goat processing plant.

This report examines all the relevant economic issues surrounding the likely success of a new goat processing plant operating in the Sandersville, Georgia area as well as the potential economic return to the community. The report begins by examining current goat slaughter/processing capacity and goat production in the relevant area around Sandersville, Georgia.

Purpose of Study

Diminished farm returns due to drought, urban sprawl and low commodity prices are forcing farmers to identify alternative enterprises that may create a profit and reduce risk. Goat meat production has been identified as a potential alternative. Goats are resourceful rudiments, which have few strict requirements for survival. The lack of quality forages due to drought will not be problematic in goat production. A goat can survive off shrubs, forages, chutes, and tree leaves. This has created opportunities for farmers to add an enterprise with little worry of drought adversely affecting returns.

Georgia's ethnic population has expanded since the early 1990's. The Hispanic population from the 2000 Census was 435,227. With new cultures emerge new market opportunities for Georgia's farmers. One of these opportunities is the establishment of a consistent goat meat market. Goat meat consumption is high among Hispanics, Muslims and Tropical persons (those people from the Caribbean and Western Africa). Many ethnic groups choose goat as their staple meat over beef, poultry and pork provided in the market place. The demand for goat exists in the market, however, goat meat does not appear readily available. This creates the common situation of people purchasing goats and slaughtering them on their own. This was common practice until new regulations and increasing health concerns arose.

Increases in ethnic populations also increase spending on certain products. Hispanic buying power has risen 250.6% from 1990 to 2001 according to the Selig Center for Economic Growth at the University of Georgia. The increased buying power is disposal personal income and amounts to a state level of $4,777,628 placed on the Georgia's economy for goods. This increase in buying power exists for the Muslim and Tropical market as well, however, the methodology of collecting the data does not allow us to break those groups out from the Non-Hispanic White and African American sectors. Minority markets are expanding and products targeted to these markets have potentials to succeed if the price and quality meets the utility of the purchasers.

Goat Meat History

"The goat is the one of the smallest domesticated ruminants which has served mankind earlier and longer than sheep and cattle" (Haenlein, Newark). Goats have been used throughout time for meat, milk, and wool. Goats were kept in most regions of the world due to their adaptability. In 1990, 480 million goats populated the world. That same year, 1990, milk goats produced 4.5 million tons of milk (North Carolina State University Extension). Goat cheese is an important economic item to many of the European and Mediterranean countries. In Asia and Africa large goatherds symbolize capital assets and wealth, in addition to providing nutrition. Researches at various universities estimate the United States to have between 3 to 5 million goats, with Texas leading in the meat category and California in the dairy.

Goat meat offers buyers low fat, tasty meat that can be prepared in a number of ways. Goat is available in a variety of cuts, similar to beef. Chevon, ground goat meat, can be substituted for ground beef and produces a less greasy meal. In fact, goat meat is the number one consumed meat in the world, approximately 65% of all red meat consumed, according to Zane Willard at Texas A&M University. Goat meat is consumed heavily in other nations. Texas A&M suggests that if retailer placed goat meat into their meat cases they would have steady demand for the product. A survey completed by Texas A&M shows that commercial retailers feel they could sell 4.8 million carcasses a year versus production of fewer than 2 million slaughtered a year.

Market Structure

Brokers purchase a majority of goats from livestock auctions. These brokers then resell the animals to processing facilities or consumers directly. The researcher perceives that most goat producers dislike this market arrangement believing it increases price volatility. They also believe the broker receives the largest portion of the retail price spread. Brokers are inconsistent in the markets. Some may appear one day or for an extended period, then not be seen for even longer periods. Researchers at Clemson University believe that many of the goats purchased in the south by brokers end up being relocated to the northeastern market. New York and other eastern cities have large ethnic populations, hence higher goat demands.

Presently, due to the high demand for goat and an immature distribution and processing system, the goat quality is indistinguishable in the price. Low quality goats and high quality goats bring similar prices. A strong bias does not exist because many consumers buy what they can find. The author hypothesis that when the market approaches maturity, distinguishable goat meat quality will bring market segmentation and price differentiation.

There are many types of meat goats, Boer, Tennessee Fainting, Kiko, Spanish, and cull dairy goats (most common Alpine and Nubian). One problem in the industry is the lack of regulations and requirements surrounding genetics. Only certain breeds have associations tracking bloodlines with developed standards, most common are the Boer, Alpine and Nubian.

The most common goats for meat in the Southern United States are the Boer and Spanish varieties. The Boer is a large frame double muscle goat typically with lean meat and a lighter flavor. This goat originally came from South Africa and was developed solely as a meat producer. Boer goats can thrive on any type of grazing available. The Spanish variety is indigenous to the southern United States and has lower quality meat. These goats are smaller in size but have adapted to live in places with little vegetation. Prices of these full-blooded animals vary.

Gail Bowman, author of Raising Goat Meat for Profit suggests those interested in raising meat goats should consider adding a few purebreds into the herd in order to increase the quality of their stock. Often the purebred animals can assist in improving the herd and offer additional income by producing good sires for sale.

Goat Meat Demand

Immigration of goat meat consumers is estimated at approximately 10,000 per month over the next few years (Harwell, 1996). The Hispanic population increased 120% from the 1990 census to the 2000 census in Georgia. Having this increase in the ethnic population with the strong economy, and the economic status of these households' increases. This allows the ethnic consumer to better choose what products they wish to purchase, including quality in products already being sold. Currently, goat meat is a relatively pricey item in the market place when compared to other cuts of meat. However, many people choose to keep their ethnic identity and eat food familiar to their culture. Canadian researchers expect goat meat demand in the ethnic market to increase because: 1. ethnic households usually have more multi-income families then other groups, 2. ethnic groups typically spend more of their income on food.

Different cultures demand goat in varying forms. Each goat purchasing group differs in their quality demands. This further confuses the American processor attempting to gain market space. Some groups enjoy the larger carcasses while other want the smaller goats. Even with the small goats, prices can change dramatically

depending on the fat content. Orientals and Western Africans prefer larger goats (70-90lbs live weight), Hispanics, including Mexicans, prefer medium sized goats (50-70lbs live weight), Muslims and Greeks prefer smaller goats (30-60lbs live weight). These preferences change with holidays and festivities. Greeks will purchase 15lb goats during the winter season and bake the entire goat intact. Hispanics or Mexicans consume more goats during the wedding and barbecue season. Muslims require a live animal during the Feast of Abraham's sacrifice. Africans and people of the Caribbean often buy the goat meat in 2lb packages with the skin still on the meat. A simple burn off of the hair makes this meat attractive for its bountiful flavor to the afore mentioned people. The non-ethnic market for goat meat has not been quantified or established. Little information exists if Americans will accept and begin to consume goat meat in the same quantity as other livestock.

Goat meat can be marketed in two niche markets towards the domestic population. The Alberta Department of Agriculture, Food, and Economic Development believes the lean meat quality of goat can be targeted to those requiring or desiring a lean meat diet. The other niche market is the gourmet or diet sector. Those serving food in restaurants of ethnic origin or practicing gourmet cooking. Chevon (ground goat) has gained some market with the gourmet consumers. The Food Institute feels that the majority of goat consumed is in the form of stews or curries.

People with digestive problems can consume goat meat more easily then other meats. The structure of goat meat allows for a quick breakdown and easy absorption into the digestive system. Different types of goat produce different cuts and flavors. Boer goats, the preferred goat for meat production, produces a light flavor similar to veal. Dairy goats have a heartier flavor.

The Apparent Atlanta-Metro Area Goat Market

In order to investigate the goat meat market in the larger ethnic areas of the state, researchers for Center for Agribusiness and Economic Development (CAED) performed a survey of 21 Atlanta Area ethnic stores during the Month of April. This survey time period comes after the peak of the season during early spring. An additional 5 stores were identified with similar ownership. Interviews with the shop owners yielded positive evidence of a large goat meat market. Market demands for carcass size and quality was consistent with prior research.

Muslim stores (9 stores) offered fresh Halal blessed carcasses weighing in the low 20's to mid teens (pounds). None of these Muslim based stores sold frozen goat meat. All the meat was sold in whole carcass form with the buyer provided the opportunity to choose and select different cuts. Whole carcasses could be purchased for an average price of $2.99 per pound. Legs could be purchased for an average of $4.02 per pound and ribs went for an average of $3.29. These carcasses appeared to be younger goats with a medium red to lighter red color and low fat content. This is important because it represents a higher quality young goat. The wholesale prices for these goats (hanging

form) went from a low of $1.79 per pound to $3.00. The average wholesale price was $2.50 per pound. This price came form taking the average of the wholesale prices provided to the researchers from the store owners.

An interesting finding of this research is that the African and Caribbean markets (5 stores) sold frozen meat and lower quality fresh meat, but at higher prices. Most "Tropical" stores sold meat in packages of 2lbs and higher often with various pieces of a frozen carcass cut up and bagged. There were non-distinguishable prices between the bags of different sections of the carcass. It was perceived that ribs brought a similar price as the shoulder when cut into 2 inch pieces and bagged. What is important here is that the goats sold tended to be from older larger goats, either sex, with a darker red color and lower fat. Some mentioned a preference for castrated goats stating it reduced the "musky" or "strong" flavor. Often these goats were sold with the skin still attached to the meat chunks and was called "burnt goat meat" or "smoked meat". The average price per pound was $4.06. Many of the shop owners stated they would prefer selling fresh meat instead of frozen if they could afford it. The wholesale price paid for this fresh meat averaged $2.50 per lb. The goats were delivered either hanging or frozen boxed. Most of the frozen meat came from Australia, which is believed to be of a very low quality due to the length of time the meat was frozen.

Hispanic stores (5 stores) offering goat meat also sold the meat packaged in various size bags. This meat came frozen and the average price on the retail side was around the $3.14 per pound if purchasing the whole carcass. The legs frozen averaged $3.84 per pound, racks averaged $3.39 per pound, and various bagged pieces averaged $3.29 per pound. Fresh meat could be purchased from the Hispanic markets not selling frozen meat. Fresh prices were very similar to frozen with an average whole carcass selling for $3.14 per pound, racks averaging $3.84, legs averaging $3.29, and pieces averaging $3.14. The Hispanic market appeared separated between frozen and fresh. The frozen meat was a dark red color and came boxed. The storeowner would cut most of the meat for pieces in various size bags. A couple of the better-looking carcasses were kept in the cooler for those demanding legs and ribs. The fresh market brought the same prices as the frozen. The carcass looked to range in the medium to large size. Billies were apparent by their wider shoulder and neck. This fresh meat was a medium to dark red with low fat and looked better than the frozen.

The farmers' markets specializing in ethnic goods located in the Northeast corner of Atlanta, Georgia also offer goat meat. Three of these markets were surveyed with average whole carcass price of $2.94 per pound, legs averaged $3.92 per pound, racks averaged $3.06 per pound and pieces averaged $2.99 per pound. Meat appeared to be medium in color, not a dark red but a lighter red with low visible fat. Counters only offered pieces but customers could ask attendant to view the whole carcass. The animal can be cut, but only on legs or racks.

Interestingly enough, the Muslim market sells the higher quality goats, the younger lighter in color smaller carcass, in the retail market at a lower price per pound of whole carcass than the other markets offering a lower quality carcass at a higher price.

These “quality goats” however, brought more per pound than other goats when sold as legs. The prices for racks (ribs) were the same regardless of market or quality. The Muslim market, which purchases most of the young goats, also had the lowest average wholesale price at $2.50. The average for the Hispanic groups was $2.72 and the “Tropical” group averaged $2.70. The farmers markets visited were not as willing to reveal their wholesale price. One mentioned a price of $1.99 per pound of frozen. This same market commented on the fresh meat in the area being of a lower quality, but with a higher wholesale price than the frozen.

The next four charts summarize the average prices per cut and market observed in the survey. The last chart compares the average wholesale price in Atlanta, Georgia compared to Miami, Florida wholesale prices reported by Frank Pinkerton and Louis Nutti of Texas A&M University.

Figure 1. Atlanta Area Fresh Market Price Averages, April 2001.

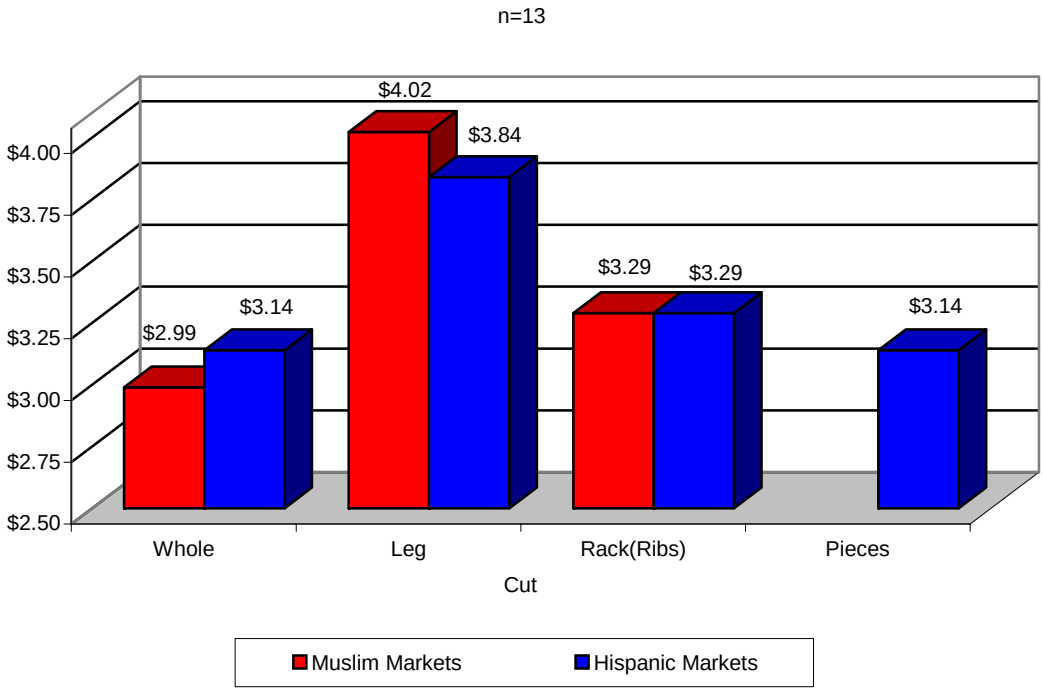


Figure 2. Atlanta Area Frozen Market Price Averages, April 2001
n=11

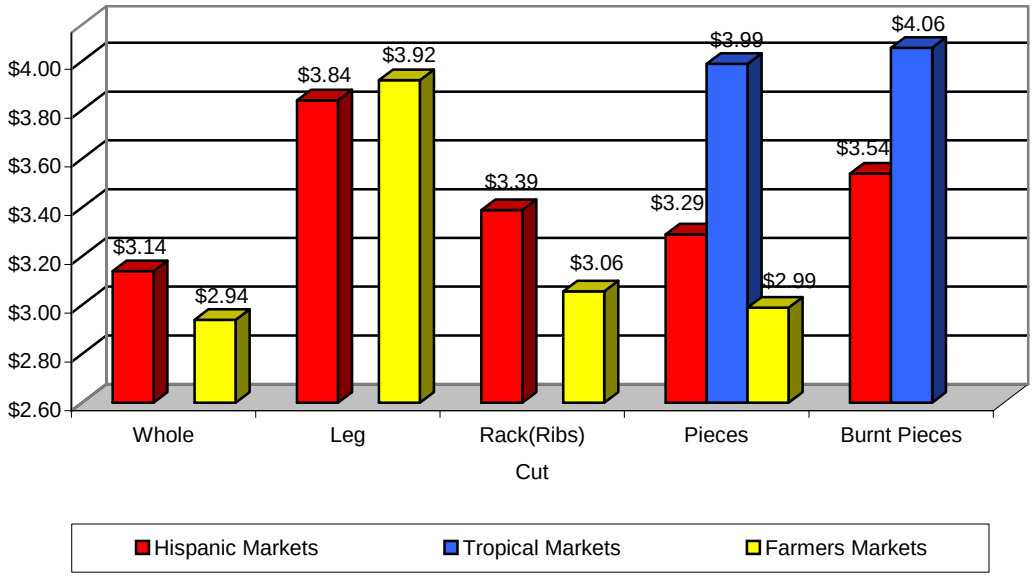


Figure 3. Average Wholesale Price Paid by Atlanta Area Retailers, April 2001

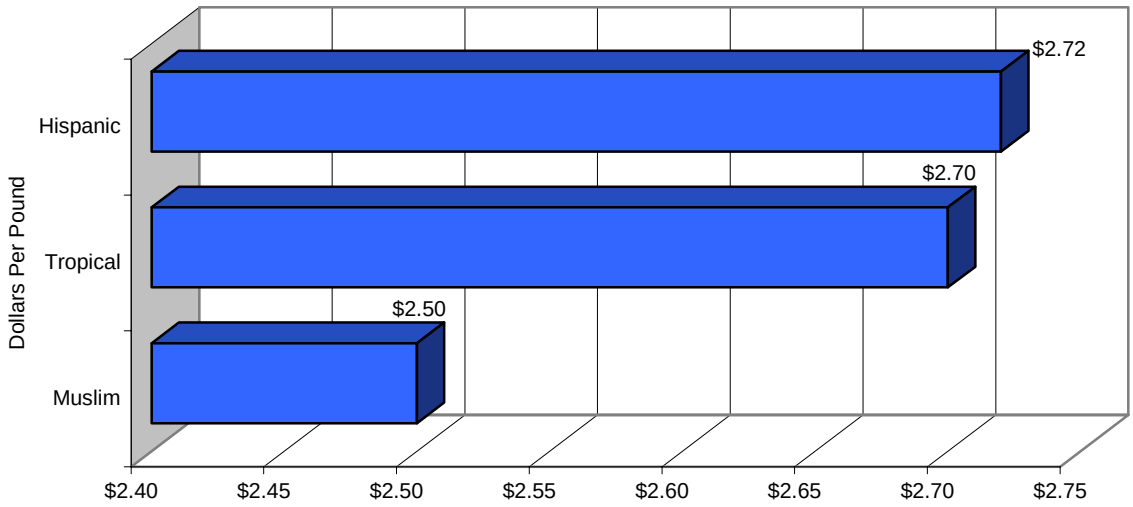


Figure 4. Northeast Atlanta Farmers Markets Average Prices, April 2001
n=3

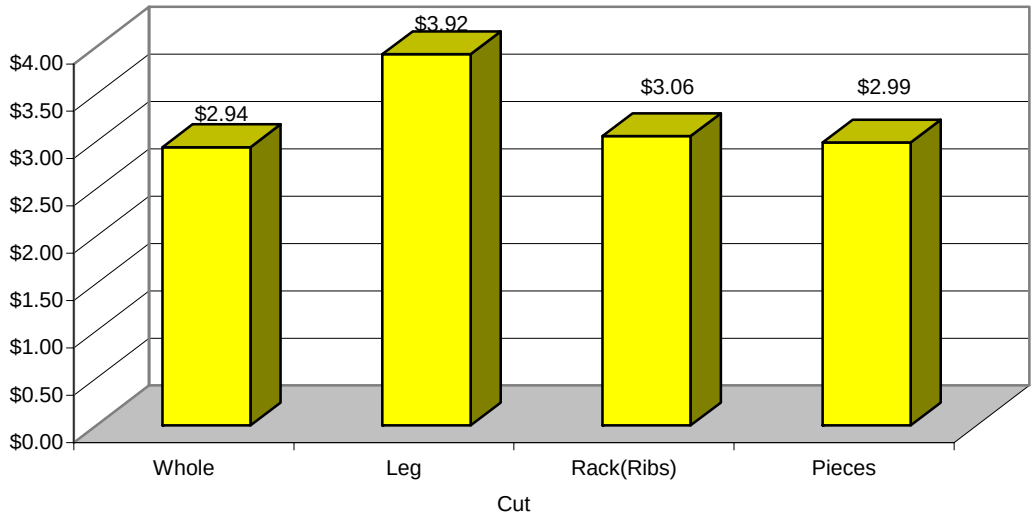
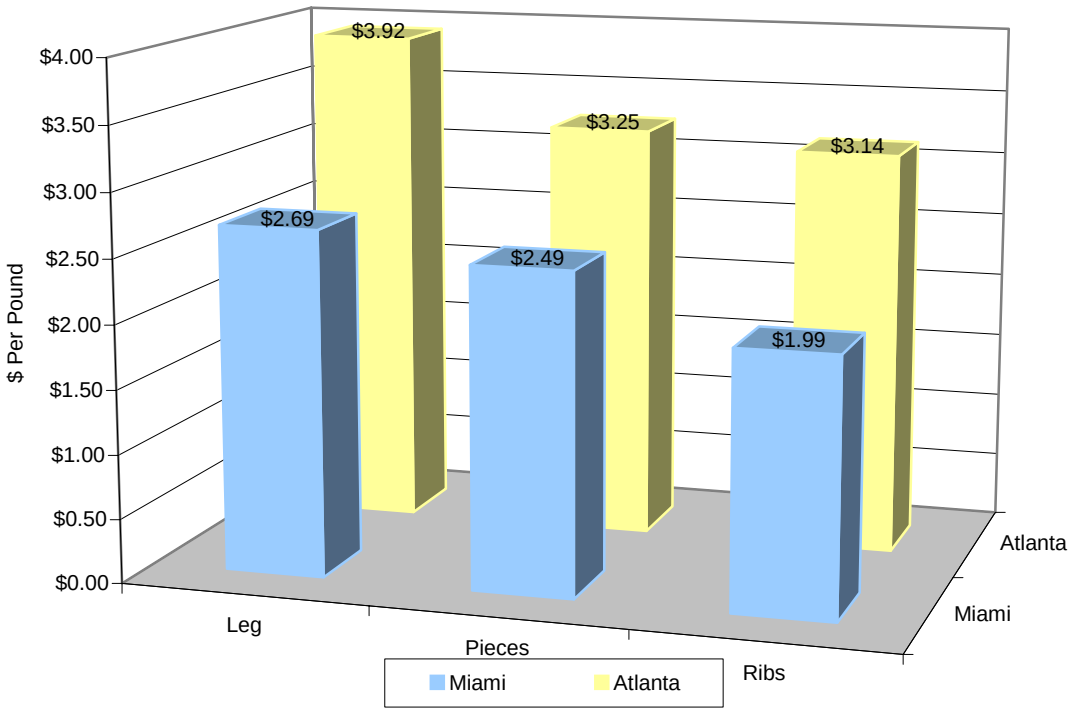


Figure 5. Miami vs. Atlanta Average Wholesale Prices



Marketing of goats to the various ethnic groups requires additional investigation. First the marketing of fresh cuts prepacked cuts with varying prices in the consumer market as case ready products obviously holds some promise, however it is not feasible to pursue this option for the study without product in the market. A second possibility exists in the skin on, scalded or burnt goat market. This market will require regulatory approval and samples to determine the market potential. Categorization of the product into the market should parallel the results of the market analysis initiated by Louisiana State University, Texas A&M University and the University of Georgia that shows market gains by product differentiation.

A potential to market goats exists in many cities in Georgia. Vidalia, Cumming, Gainesville, Thomasville, Albany, Rome, and Atlanta all have a significant ethnic population to support the delivery of carcasses to these points. Further investigation needs to occur in this area to determine the desired cuts and quality of meat. A portion of the population in these cities is based on seasonal work demands, fruits and vegetables and construction. It will be important to market the goat meat during the work demand but keep contacts during the slower periods.

Goat Meat Supply

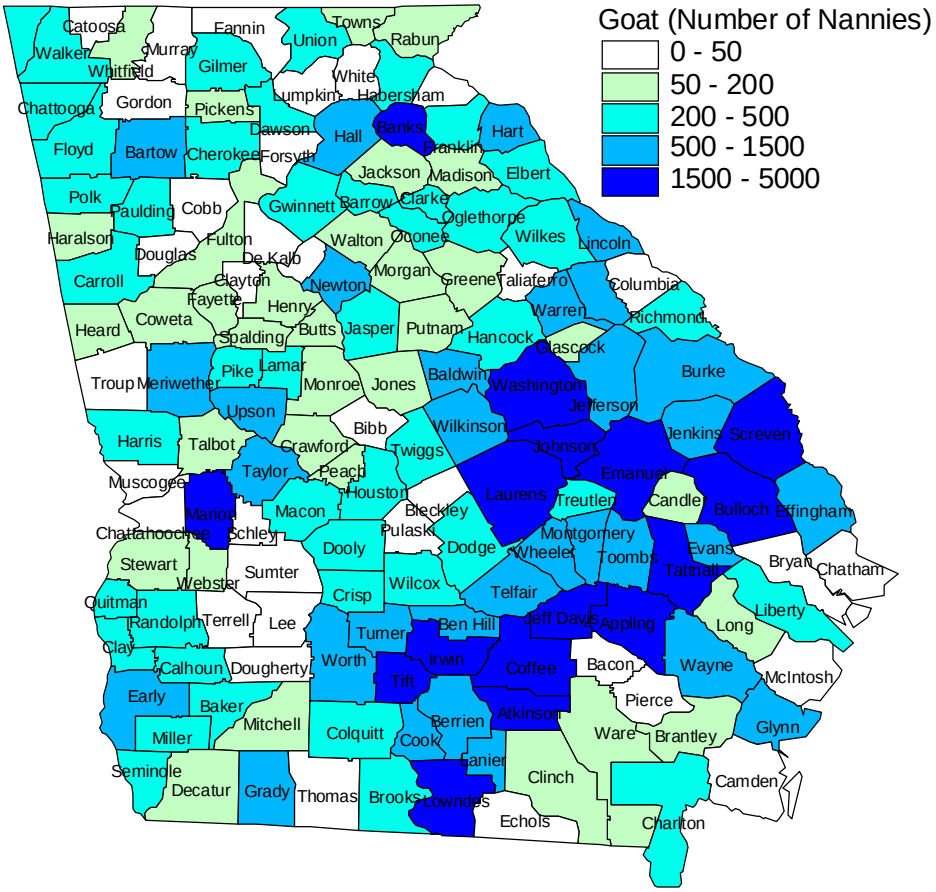
According to the United States Department of Agriculture's (USDA) Foreign Agricultural Service division 12.4 million pounds of goat meat were imported into the U.S. in 2000, an increase of 67% from the previous year's imports of 7.3 million pounds. The dollar value of these imports was $13.6 million, which equates to a rough price of $.91/ pound. The availability of goat meat from outside the U.S. will have an effect on the prices received at the market. If other countries can supply goat at a lower cost, a price ceiling will be created for domestically produced goats unless domestic production can be differentiated by consumers.

The USDA in conjunction with Australian agricultural officials estimate the size of the Australian goat herd to be approximately 2.5 to 5 million head of feral animals. These animals range free on private land are not typically raised for production. Ranchers herd these animals with dog and trucks and bring them to market. Due to vast landscape and limited infrastructure, limited information on the goat herd size has been collected. The estimates show a slight increase from previous years.

According to the Center for Agribusiness and Economic Development at the University of Georgia, the total nanny population in Georgia for 2000 was 100,869. Goats can often be bred 3 times in two years or at least once a year.

Figure 1 shows the annual number of producing nannies in Georgia by county. Upon close examination of the map one can see a pattern of high production centered around Washington County. A plant located in the center of the production area should theoretically allow the plant to operate more efficiently due to the large number of goats and less transportation associated with delivery of the animals. Goats often stress out during transportation and adjustment to holding pens. The location of the plant should diminish some of these quality-affecting factors.

Nanny Goats by County, Georgia 2000



Source: Center for Agribusiness and Economic Development

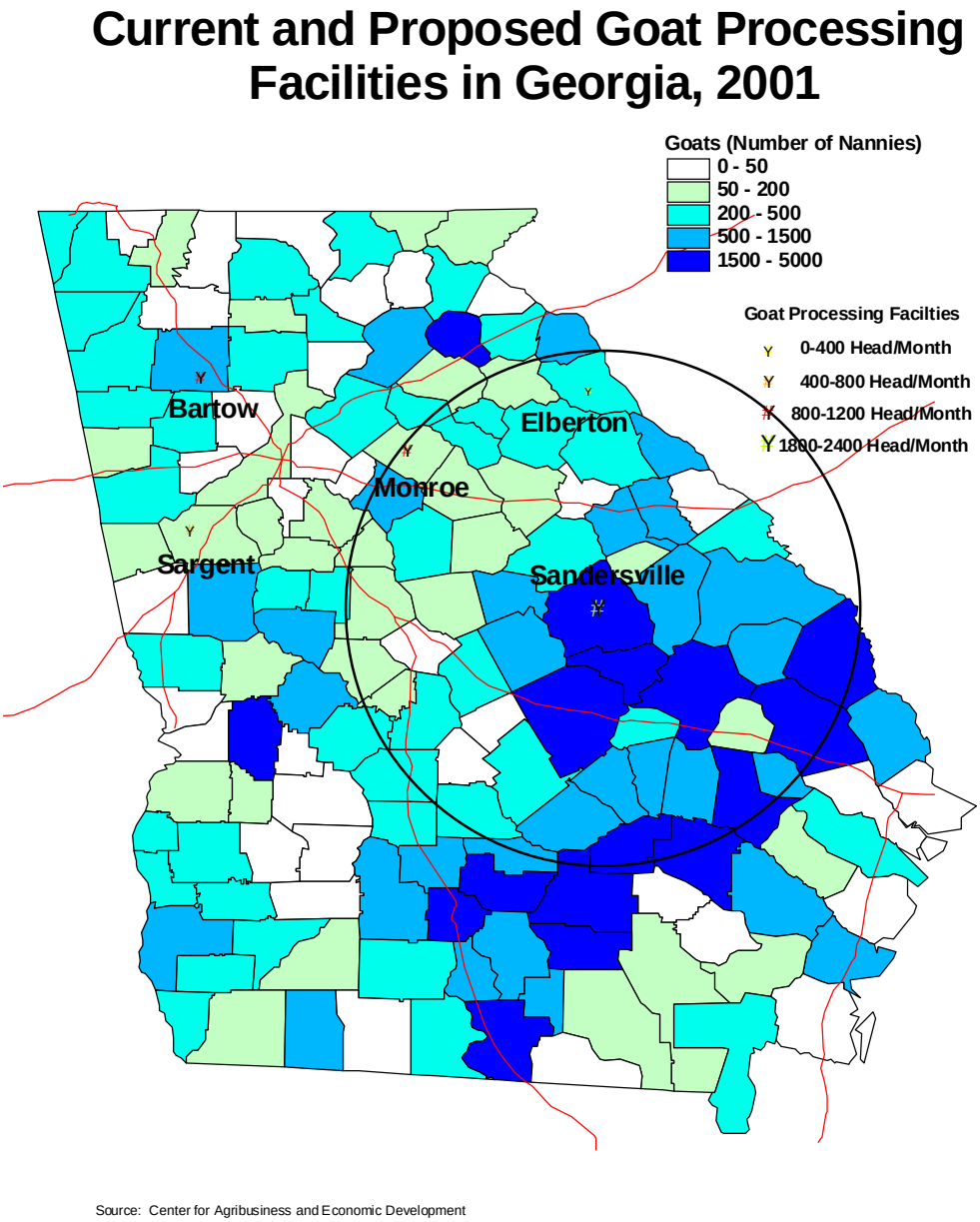
Table 1. This table indicates the total number of producing nannies within the 75-mile radius of Sandersville, Georgia. The total number, 56,090 can be seen by county. Estimating that each nanny yields 1.25 kids per year produces 70,112 goats available in the 75-mile radius for market.

County	# Goats
Appling	2000
Baldwin	550
Barrow	325
Ben Hill	950
Bulloch	2000
Burke	1000
Butts	75
Candler	100
Clarke	300
Coffee	5000
Crawford	150
Crisp	500
Dodge	250
Dooly	250
Elbert	500
Emanuel	2000
Evans	600
Glascock	100
Greene	150
Hancock	500
Hart	1300
Henry	200
Houston	300
Jackson	200
Jasper	250
Jeff Davis	5000
Jefferson	1000
Jenkins	850
Johnson	2100
Jones	115

County	# Goats
Lamar	450
Laurens	5000
Lincoln	600
Macon	500
Madison	150
McDuffie	600
Monroe	200
Montgomery	1000
Morgan	200
Newton	780
Oconee	300
Oglethorpe	500
Peach	150
Pulaski	50
Putnam	185
Richmond	500
Screven	2400
Tattnall	3000
Telfair	1000
Toombs	1500
Treutlen	275
Twiggs	450
Walton	150
Warren	1500
Washington	3500
Wheeler	935
Wilcox	400
Wilkes	400
Wilkinson	800
Total	56090

Processing Plant Competition

Figure 2 indicates the four largest processors of goat meat currently in Georgia. Two of these plants, relatively close to Atlanta, primarily slaughter goats and have monthly averages in the range of 850-1000 head. One of the plants is relatively new but has begun slaughtering goats. Their monthly estimates of slaughter are currently around 100 head. The fourth plant slaughters approximately 500-600 head per month. These figures came from Georgia's Department of Agriculture and are approximations, thus some plants slaughter less or more.



Estimated Cost and Returns from a Goat Meat Processing Facility

This section will explore the components necessary for starting a processing plant in Washington County Georgia. An existing slaughter plant can be purchased by the group in Sandersville for a price of $90,000 before repairs. This plant can be easily renovated and updated to a goat processing plant. The cost data and other numbers were supplied by various private firms, the University of Georgia's Department of Food Science and University of Georgia's Department of Agriculture and Applied Economics. Before products can be sold on the market their breakeven needs to be established. This allows for a profit/loss margin to be calculated.

The following cost figures are for a goat meat processing facility slaughtering 450 head per week at an estimated 18% capacity. Each working day, 90 head will be processed and stored for sale. The annual supply of goats needed will be 22,500. Cooperative Extension service personnel feel this number can easily be achieved. This number of head will transform into 1,125,000 pounds of goat prior to assumed processing and 571,500 pounds after processing. The percent dress conversion used is 46%. This number came from a collaboration of opinions of universities and food scientists.

Following good production recommendations the plant is hoping to stagger the supply to meet the seasonal demand with the highest desired goats. So, kidding will be year round and not just the normal spring kids. The young high quality goats will still be available during the peak season in the spring.

Income

Calculated income came from the estimated pounds to be sold based off 450 head per week with a 46% dress conversion ratio. The processed pounds totaled 621,000 multiplied by the market price of $2.80 per pound, which was thought to be an acceptable price if boxed and delivered, creating a gross income of $1,738,800 annually. The plant may be able to earn extra income with sales of the hides, but currently they are not included in this calculation. Subtracting the total costs the income creates a profit of $70,828 or roughly $.11 per pound. Increasing the plants capacity will create a greater income, as the fixed cost will be spread out over more products. Refer to appendix page 46.

Start Up Costs

Before any slaughtering can begin repairs and inspections need to occur at the proposed location. The estimated amount for the repairs is $15,000. The cooperative has volunteered labor for cleaning and minor repairs in order to save money and make sure these tasks get accomplished in a timely manner. In addition to repairs the cooperative may face $50,000 to $100,000 in legal and/or accounting expenses. See appendix page 47.

Equipment Costs

Equipment figures came from the Food Science Department at the University of Georgia and various private equipment sales firms. The existing facility already has some pieces of machinery, grinders, saws, coolers, tables, and other pieces, the fixed and variable costs in the following two paragraphs covered repairing not replacing this equipment.

Much of the needed operating equipment was small but essential items, such as various hooks, buckets, saw blades, clothing (mocks, gloves, etc), shackles and other small pieces. The total amount spent for these items by requesting prices from private firms is approximately $13,000. See appendix page 51.

Fixed Costs

Fixed costs associated with this processing plant include the plant administration, depreciation on the building, equipment, and interest on the investment funds. The researchers chose to place the administration in the fixed costs category, since they should be fixed hours and salaries, versus the regular staff, which could change with the processed number of head per time period. The projected fixed costs for this project is $80,328 or $.13 per pound of meat processed or $3.57 per head. See appendix page 46.

Variable Costs

Variable costs associated with this project include labor, utilities, insurance, repairs, and operating costs. Operating costs include: paper, boxes, cleaning supplies and disposable clothing items. All these change depending on the number of head processed. Positive correlations exist between the head processed and the variable costs. These costs will be discussed in their corresponding sections later in the paper. See appendix page 46.

Direct Costs

The figure for the direct costs stem from the purchasing price of the live animals, at $1.00 per pound on an average size goat of 60 pounds live weight. The total direct cost is $1,364,180, which includes feed and delivery cost. The researchers found $1.00 per pound to be a good price for the producers. This number is just a base number and will be modified by type and quality of goat. The cooperative will establish guidelines for average, good, and poor animals. Criteria used for these guidelines will cover flesh, muscling, size, marketability, fat cover, and type of animal. See appendix page 46.

Direct Labor

Labor costs calculations include the salaried and hourly labor to run the plant, but not the administration figures. The labor figures are automatically adjusted with a change in heads processed. Extra butchers and laborers will be added with increases in head

processed. For the purpose of this study and from advice given by the Department of Food Science and Technology at the University of Georgia, the plant has 2 full time butchers, 2 laborers, and 1 delivery person. The regular hours of operation are 8 hours per day, 22 days per month or an hour equivalence of 2080 hours a year. The hourly wage for the laborers is $10 per hour, creating a salary for each laborer at $16,640 annually. The researchers understand this appears low, but remember these are laborers cleaning, packing and doing other work, which will be paid less in the community. The butchers receive an annual salary of $35,000. Each person employed at the plant over 3 months will receive medical and dental benefits. This figure was calculated by using 20% of the total labor costs. The delivery person will work 2 days a week for the 450 head but increases as the number of head slaughtered increases. The total labor costs equals $144,664 or $.23 per pound or $6.43 per head processed including benefits. See appendix page 46.

Other Direct Costs

These costs make up the remaining variable costs. The units of animals processed affect all these costs. Positive relationships exist among these variable costs. These costs include utilities, repairs, operating materials, and miscellaneous costs. The total for this category is $73,800 or $.119 per pound or $3.28 per head. See appendix page 46.

Condemnations

An estimated 1% of all the animals slaughtered will be condemnations, not fit to eat. This may happen by illness, parasite, or just mishandling. This is a loss for the facility because often these condemnations are not recognized until the animal has been purchased and slaughtered.

Total Cost & Profit/Loss

Adding the variable and fixed costs together gives the total cost of operating the processing plant during a regular year at 450 head per week for 52 weeks. The total cost figure equals $1,667,972 or $2.68 per pound processed or $74.12 per head. Showing that to break even the plant needs to sell the meat at the minimum price of $2.69 per pound. Using a sales price of $2.80 per pound, which came from investigating the market and literature reviews, the plant will make an estimated $70,828 annually. The plant earns $.114 per pound processed after covering all costs associated with operating the facility. The operating efficiency appears low for the firm at 4% but this should increase dramatically if more head are processed. Again, processing more head will spread the fixed costs over an increased number of units and thus increase the operating efficiency. A rule of thumb level for most operations of this type is between 20-30% operating efficiency. To obtain 25% efficiency the plant would need to process 1,200 head per week. This quantity may not be feasible on the market side. The idea that this plant was made to allow the goat producers to receive a stable and adequate price for their animals allows the firm to run at a lower efficiency. The mere concept was to maintain a market for the goats produced and cover the expense in running the plant. Increasing

shareholder profitability was secondary and is not necessary in making the financial decision to operate the facility. See appendix page 46.

Cost Comparison Summary

Four different plant scenarios were investigated, 250 Hd./week, 350 Hd./week, 450 Hd./week, and 600 Hd./week. Based on analysis, the 600 head per month facility has a cost advantage of $8.51 to $2.32 over the other facilities. These advantages have numerous sources including, economies of size in labor and equipment and a wider spread for fixed costs. The appendixes following this paper details the financial for each scenario.

A larger size plant needs to be accompanied by higher market demand. Even if the 600 head/month is more cost efficient, if the demand does not exist for that many carcasses the plant will lose money. Also, the larger the plant the higher the cost associated with by-product disposal. Environmental Protection Agency and the Environmental Protection Division have regulations regarding rendering disposal and the costs are not proportional to the animal units.

Table 2. Slaughter/Processing Cost Comparison of Different Capacities by Cost Per Head.

Cost Category	250 Hd./Week Single Shift	350 Hd./Week Single Shift	450 Hd./Week Single Shift	600 Hd./Week Single Shift
Direct Labor	$ 7.51	$ 7.96	$ 6.43	$ 5.71
Other Direct Costs	$ 5.36	$ 4.02	$ 3.28	$ 2.63
Fixed Costs	$ 6.82	$ 4.87	$ 3.79	$ 2.84
Total Slaughter/ Processing Cost	$ 19.69/hd	$ 16.85/hd	$ 13.50/hd	$ 11.18/hd

This chart indicates the economies of scale. The more heads processed, the smaller the per head processing cost. The 450 and 600 head per week plants can be competitive with other processing plants in Georgia. Custom slaughtering goats in Georgia ranges from $15 - $40 per head. The 450 and 600 head processing plants lie within the low end of this range. Refer to appendix pages 32, 39, 46, and 53.

Goat Meat Slaughter and Processing Returns

Profit versus Budgeted Cost

Assuming the figures used in the economic feasibility section are closely related to actual numbers to run a slaughter facility, the profitability for each production scenario will be as follows on the next four pages. As one can see only the 450 head/ per month and 600-head/per month slaughtering facilities create returns.

The next four pages show the plant's profitability at different levels of the budgeted costs, but over and under. This allows for better managerial decision making by adding a buffer on the volatility of input costs.

The budget numbers include operating expenses (utilities, taxes, labor, supplies), direct costs (goats), fixed costs (interest on start up cost, deprecation) and income from sales of goat meat. The costs are subtracted from the income resulting in the remaining profit or loss.

Figure 6. $ Profit vs. % Budgeted Cost, 250 Hd./Week

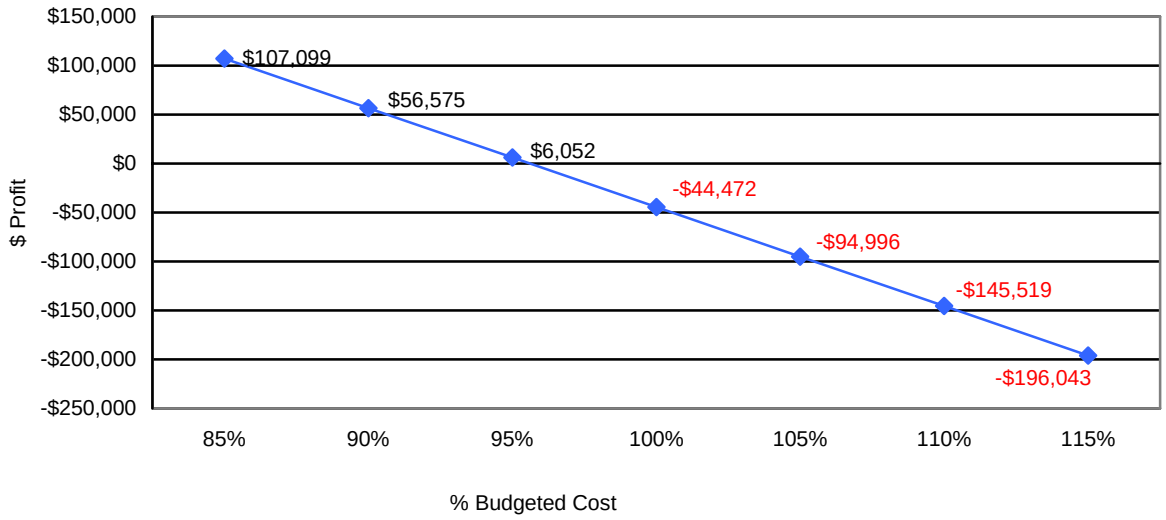


Figure 7. $ Profit vs. % Budgeted Cost, 350 Hd./Week

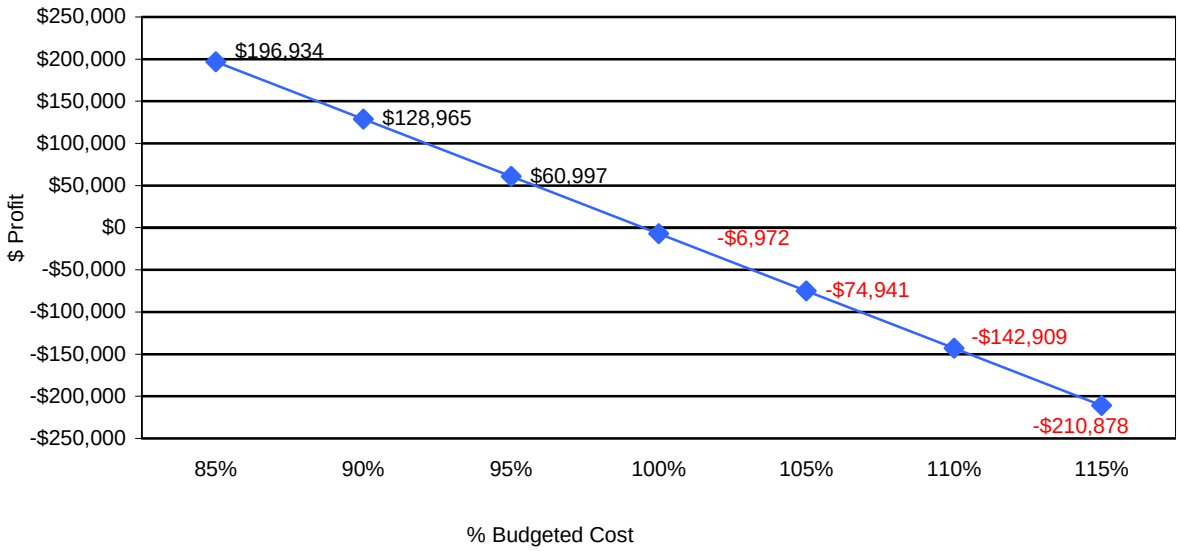


Figure 6 and 7 indicate profits when the costs are decreased by 5% of the budgeted cost. This information is useful for decision planning and risk aversion. Many costs are subject to change; utilities for example can fluctuate periodically through the year depending on supply of their inputs. The Center for Agribusiness and Economic

Development suggests a padding of 15-20% over budgeted cost to be safe. Often costs change after the start up of the business and the feasibility report.

Figure 8. $ Profit vs. % Budgeted Cost, 450 Hd./Week

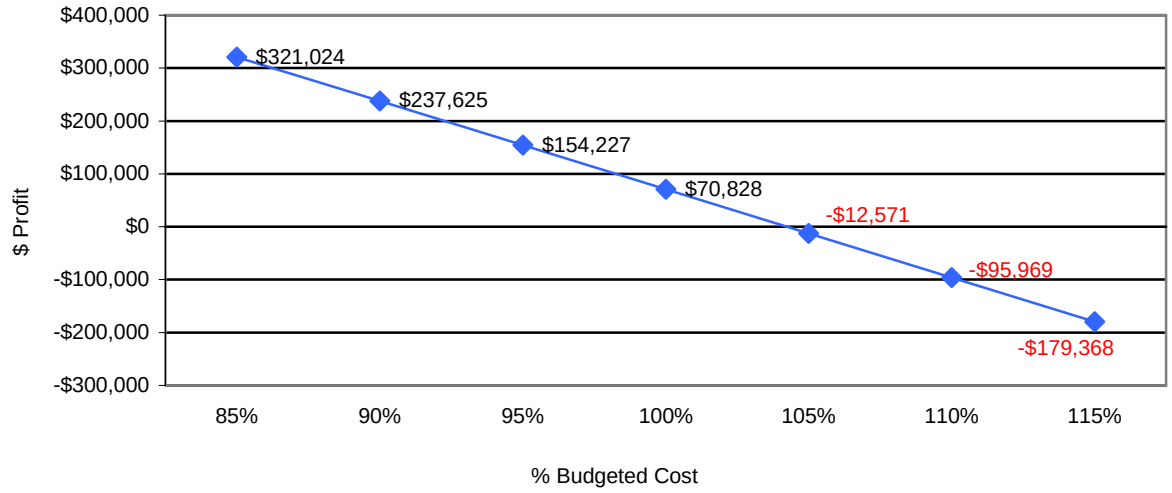
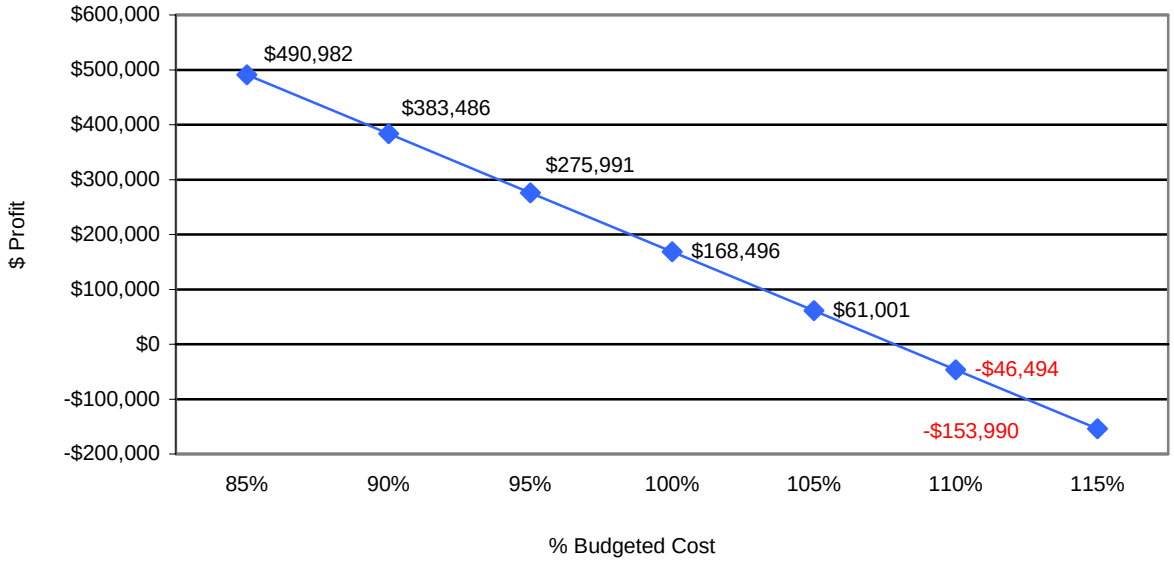


Figure 9. $ Profit vs. % Budgeted Cost, 600 Hd./Week



Figures 8 and 9 demonstrate that when budgeted cost increase the profit potential dramatically decreases. These figures offer a view of the risk analysis associated with starting new venture. Operating costs can fluctuate and affect the final outcome of the operation.

Profit versus Percent Over/Under Estimated Sales Price

This section shows how the changes in the facility's sales price affect the profitability of the plant. The obvious result is as prices decrease profits decrease, but the next four graphs also show which scenario can survive a decrease in sales price.

Figure 10. $ Profit vs. Over/Under Estimated Price/Lb., 250Hd./Week

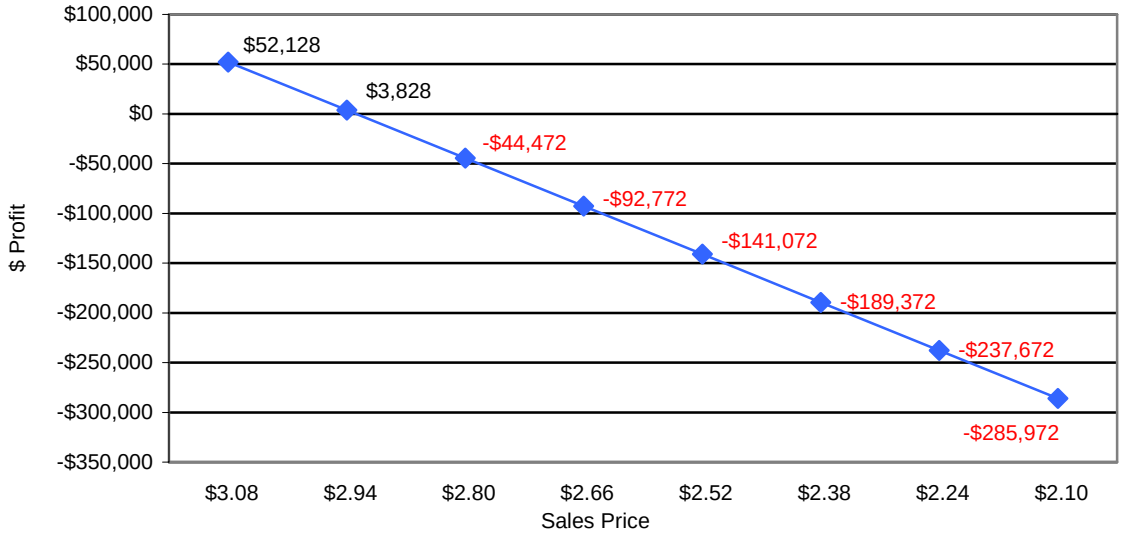


Figure 11. $ Profit vs. Over/Under Estimated Price/Lb., 350Hd./Week

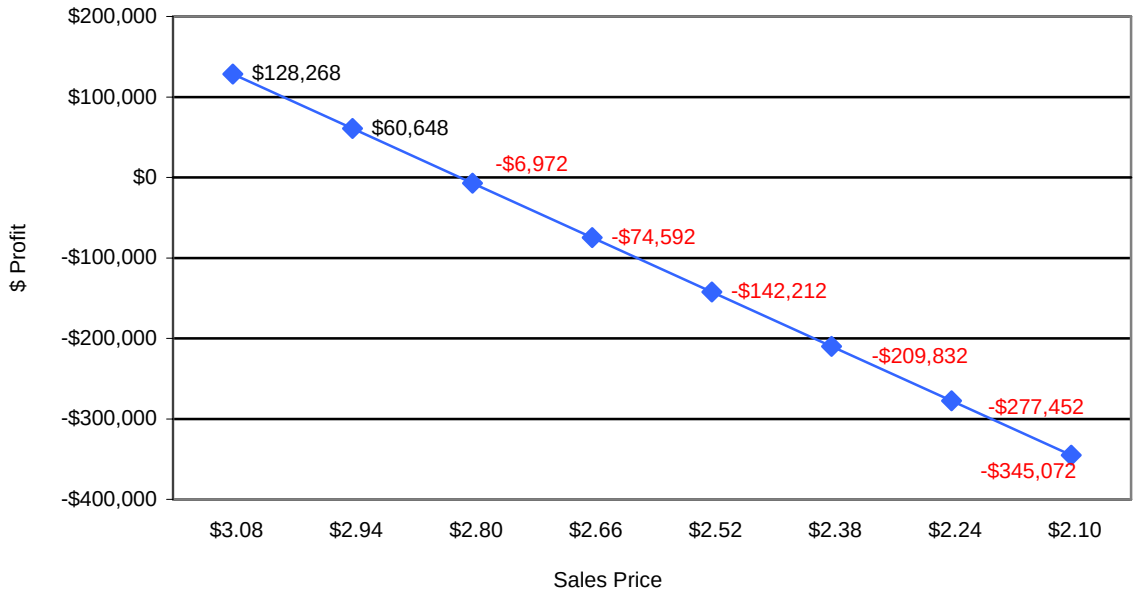
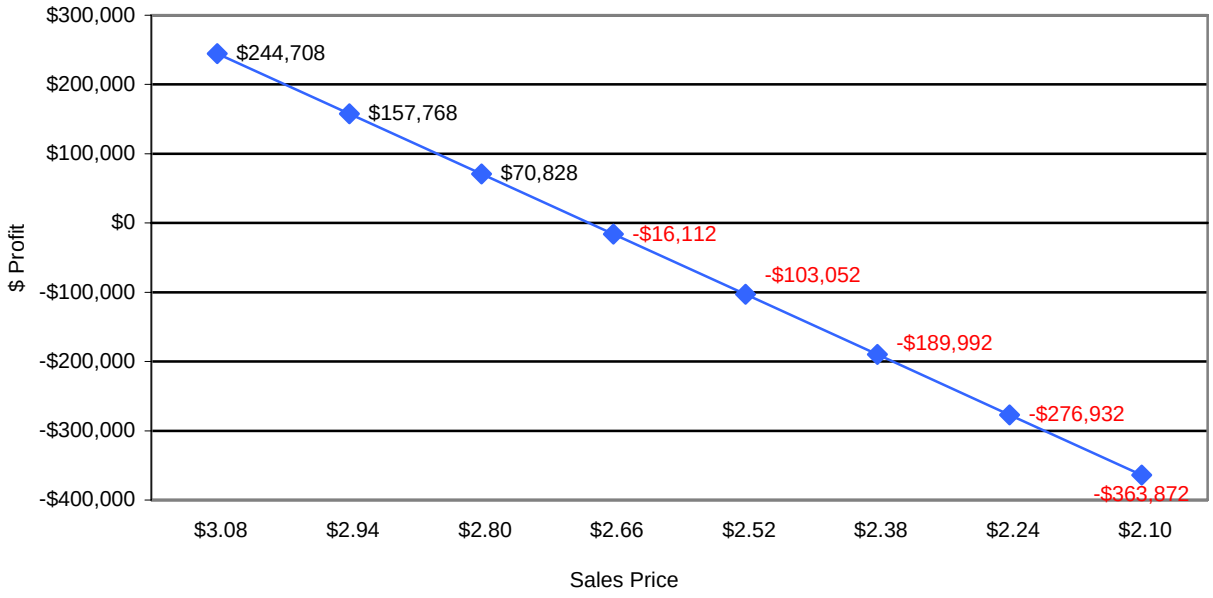


Figure 12. $ Profit vs. Over/Under Estimated $/Lb., 450Hd./Week



Figures 10-12 demonstrate that a 5% sale price decrease creates an unfeasible situation for the facility.

Figure 13. $ Profit vs. Over/Under Estimated Price/Lb., 600Hd./Week

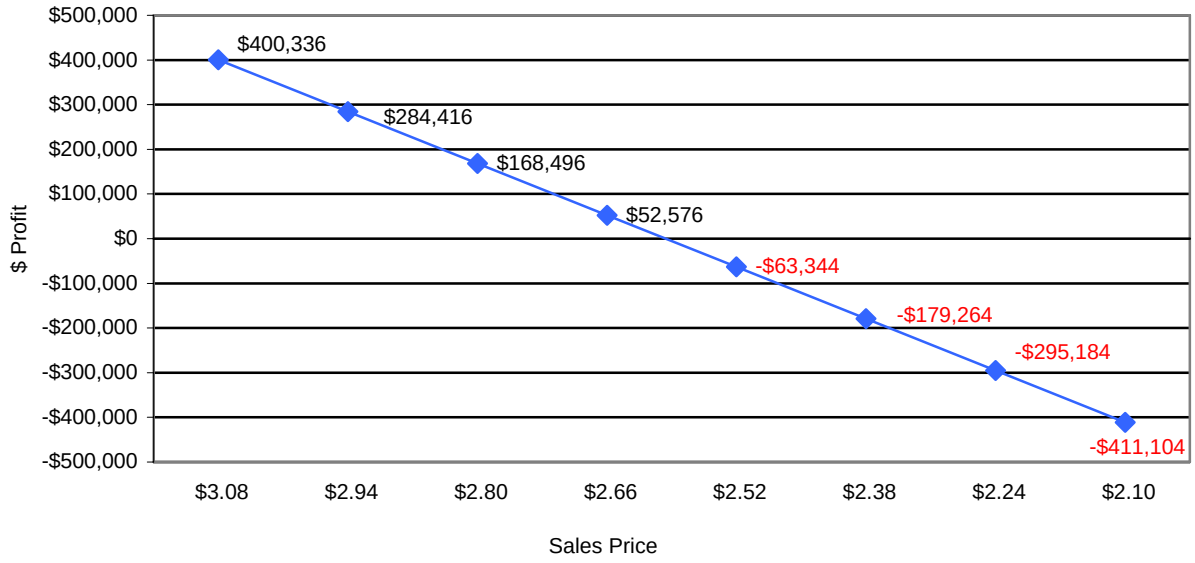


Figure 13 indicates that a 10% decrease in price will create a loss for the facility.

Cost Versus Revenue Charts

Since only the 450 and 600 head per week plants made any signs of profit the next charts will be representative of the profitable facilities. When the revenue line crosses the total cost a profit occurs. The corresponding number of heads below shows the number needed for this to occur.

Chart 1. Breakevens for Slaughtering of 22,500 Goats Per Year (450 hd per week)

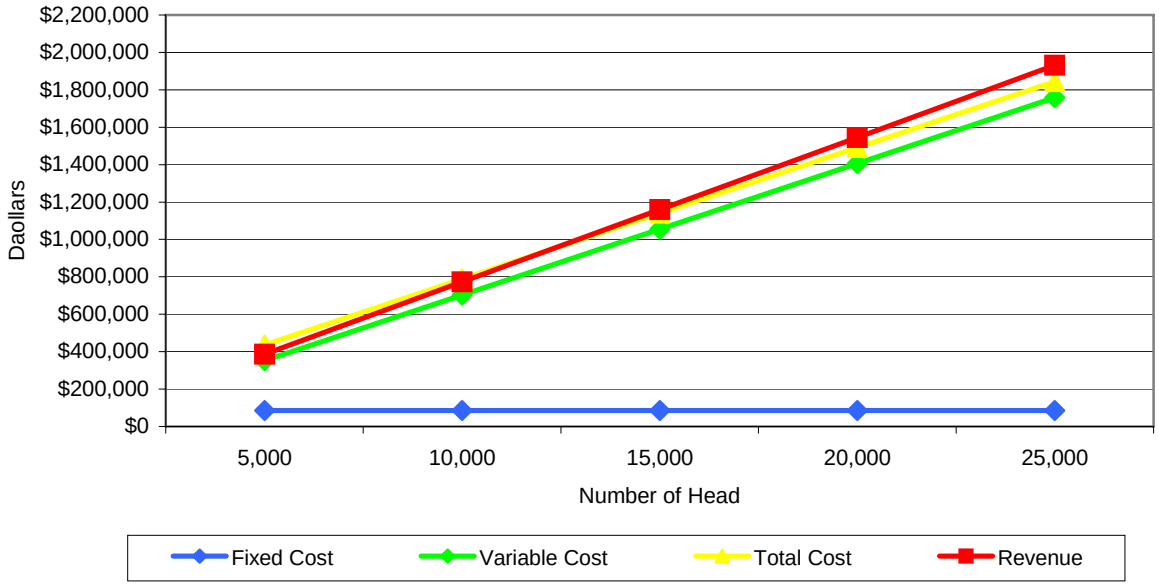
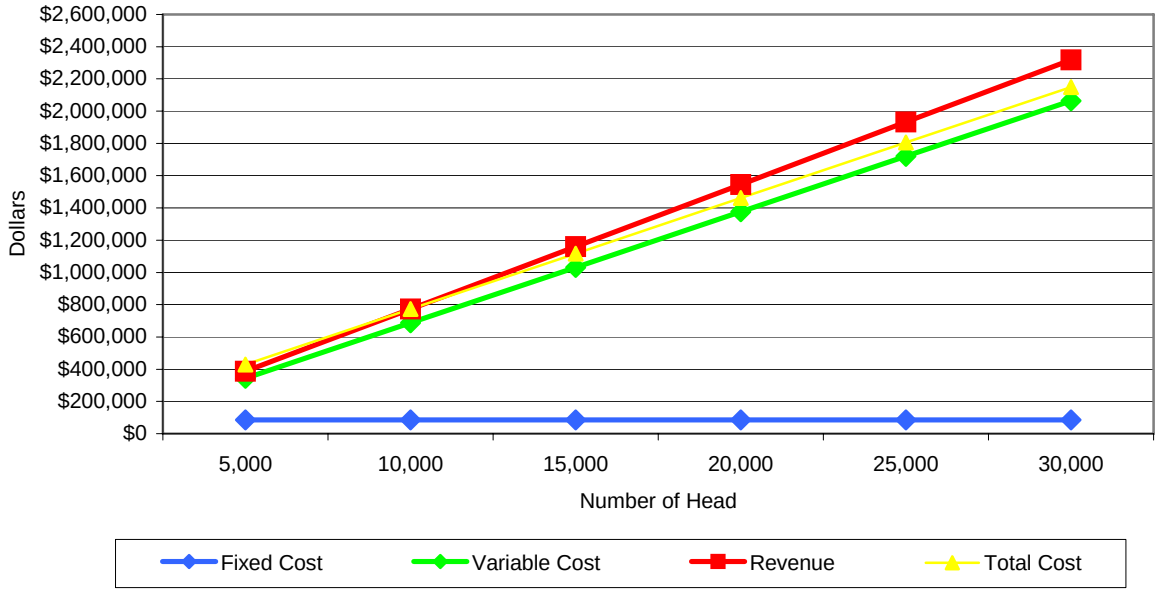


Chart 2. Breakevens for Slaughtering of 30,000 Goats Per Year (600 hd per week)



Financing, Operating, and Ownership Arrangements for a Slaughter Plant

Presently only one financing and ownership method is being considered for the plant in Sandersville, Georgia, a marketing cooperative. The main purpose of this plant is providing the local producers with a consistent and stable market for their animals. The market is fickle and prices can range from lows in the $.60's per pound up to highs in the $1.30's per pound. Potential plant investors/producers desire a steady $1.00 per pound regardless of the other markets.

Cooperatives

A special type of producer cooperative called a "New Generation Cooperative(NGC)" or a "closed cooperative" combines solutions to both the financing and operations questions. Producers would raise an initial portion of the plant's cost through stock or options on stock sales. Each share of stock would provide the right and obligation to market one goat through the plant. The remaining capital could be raised through debt financing. Operation of the plant could remain with the producer/owner. Goats could be priced to the producer through various arrangements including profit sharing of the final product. Any funds generated through an assessment per carcass or cut through the plant would be used to retire debt and would increase the producer's equity in the operation.

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

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

Producers tend to take greater interest in operations developed as a producer cooperative since they are also investors. The typical amount of member equity required is 50-60% of the initial equity needed for the project. This gives potential lenders the security of sufficient producer commitment. Banks for cooperatives have been the primary institutions that help in financing the remaining 40-50% needed by new cooperatives. Many commercial banks are also funding cooperatives. The USDA also has numerous financial programs that can assist cooperatives that meet certain criteria.

Credit unions and the Farm Credit System have also actively lent funds to farmers to invest in new cooperatives. Other helpful support systems in the development of these new cooperatives include communities, regional economic development commissions, individual rural electric cooperatives, and university extension services.

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

New Generation Cooperatives are very popular in the north central United States, especially in North Dakota and Minnesota. Examples of cooperatives arranged in this manner include ValAdCo, American Crystal Sugar, Southern Minnesota Sugar Beet Cooperative, the Minnesota Corn Processors Cooperative, Dakota Growers Pasta Company, and Northern American Bison Cooperative.

One of the keys to success of a New Generation Cooperative is producer commitment. The group of producers must be motivated, determined and committed. As Jack Piela, a business development specialist for the North Dakota Association of Rural Electric Cooperatives, stated, “Farmers have to take ownership of the concept and drive the project”(Campbell). Other keys to success include public policy that supports cooperative formation, financial institutions willing to finance the cooperative, and consultant or facilitators to help producer groups through the aspects of the process. These keys to success seem to be evident in Georgia. Georgia goat meat producers must take ownership of the concept and drive the investigation into the possibility of operating a functional goat meat processing facility in Georgia.

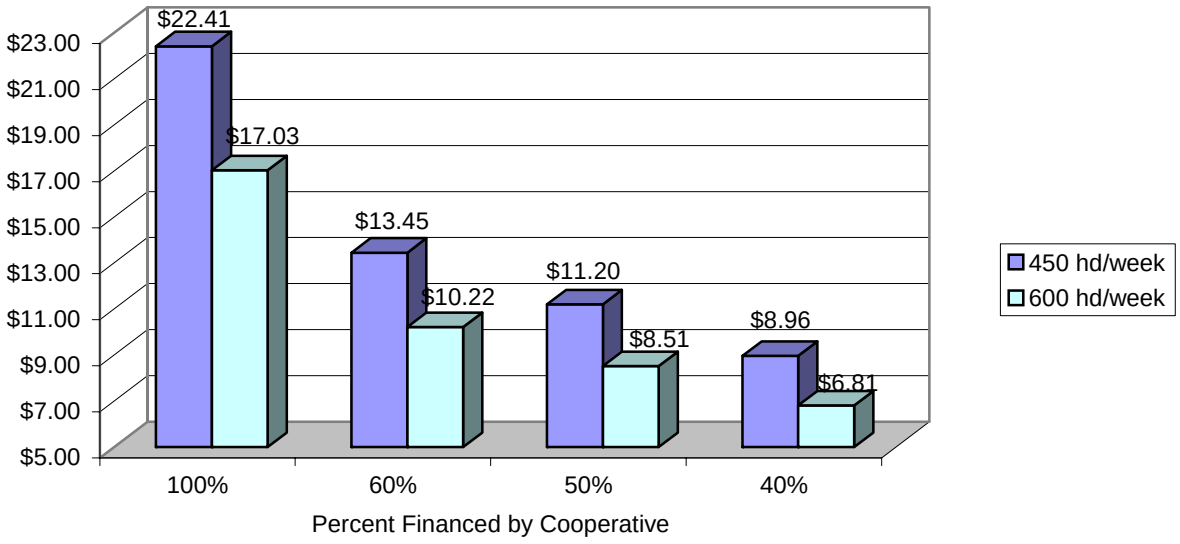
The financing in terms of shares is calculated by taking the total cost divided by the total number of animal units needed for a standard operating year. This will yield a share price for 100% financing by the producers. If the producers wish to the lower their amount of equity the share prices will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

Some feel share prices are high just to be able to sell a goat, but remember auction barns typically charge 10% commission and yardage. If one calculated the amount spent

per goat at the auction it dramatically reduces the share price producing a relatively inexpensive net share price.

The following chart shows the estimated share price for the 450 head per week and the 600 head per week plant versus the quantity financed by the producers. Each share represents one animal unit used in the facility (see appendix page 52 and 59).

Figure 14. Share Price



Another option for financing the plant is to contact the local development authorities and submit grant request to them and the state. Often the development authorities will assist in part of the grant writing or organizing of application material to be submitted to larger state funds. Currently the Georgia is taking submission for funds through the One Georgia Authority.

Return Per Share

Each share shall receive a portion of the profits. These dividends or profit sharing will occur either quarterly or annually based upon the recommendation of the board of directors. The following charts show returns per share for the 450 and 600 head per week plants versus sales price.

Figure 15. Return Per Share (450Hd/week) vs. Change Sales Price Using Budgeted Costs

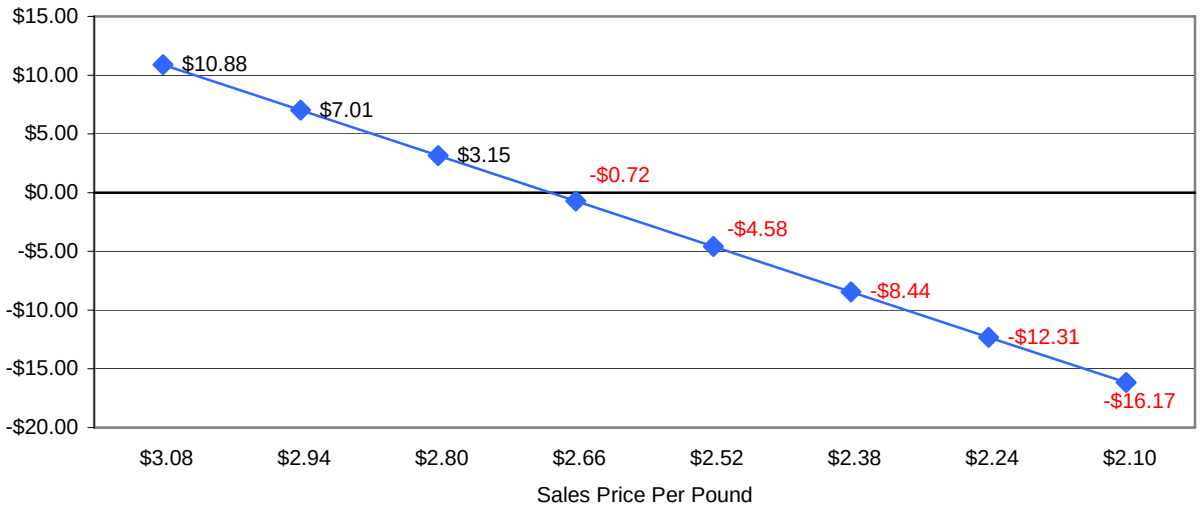
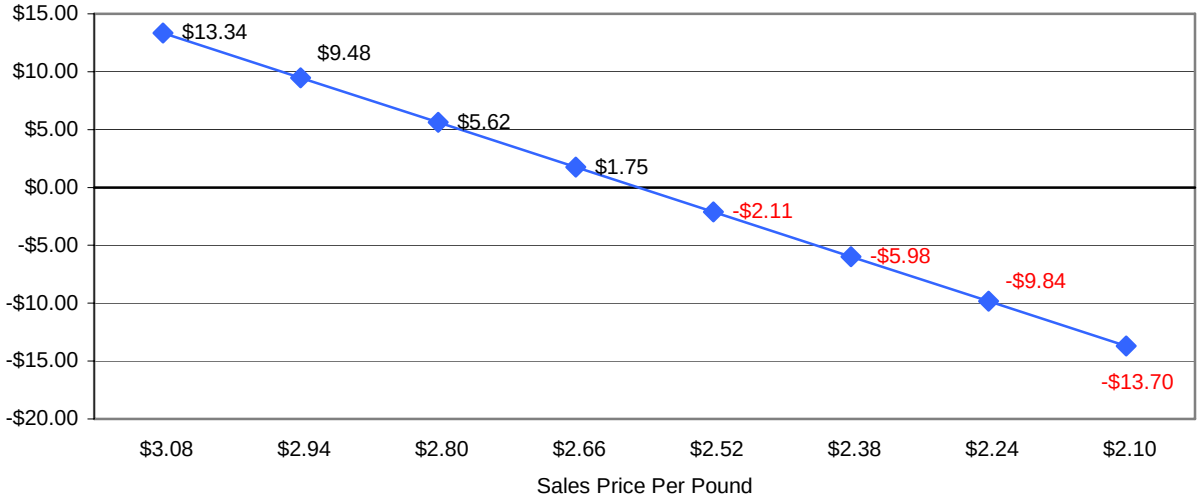


Figure 16. Return Per Share (600Hd/week) vs. Change in Sales Price Using Budgeted Costs



Custom Processing

The plant has the opportunity to provide custom processing to the community and earn extra income provided this work is done after the needed goats are slaughtered. Weekend work can provide the plant and employees with extra money during deer season. Regular rates for deer processing range from $40 to $75 per animal. Two people should be able to handle 5 deer an hour. Arrangements would need to be made for the pay scale and plant use by the cooperative.

Impact Analysis

Impact analysis is a key component of any feasibility study. An impact analysis shows the effect of a new venture on the economy. Building and implementing a goat meat processing facility in Georgia will impact the economy on two levels. The new plant will generate output as it begins selling goat meat. These sales will, in turn, generate additional sales as the plant purchases inputs. The suppliers to the plant will increase the purchase of their inputs, thus increasing demand for those items. These increased sales will ripple through the economy. An input-output model will capture and quantify these effects.

The input-output model, IMPLAN (Impact Analysis for PLANning, Minnesota IMPLAN Group) was utilized for this project. IMPLAN can predict the effects of a new venture on output (sales), employment and tax revenue. IMPLAN models can be constructed for a state, a region or a county. Input-output models work by separating the economy into its various sectors, such as agriculture, construction, manufacturing and so on. An IMPLAN model will show each sector and industry in the specific region's economy. The model can capture how a change in one industry (for example, goat meat processing) will change output and employment in other industries. The changes in the initial industry (goat meat processing) are labeled direct effects and the changes in the other industries are called indirect effects. The direct and indirect effects are summed to give the total economic impact.

For this goat meat processing study, four slaughter levels were analyzed: 12,500, 17,500, 22,500 and 30,000 head annually. However, before examining the economic impact of the plant, the issue of production should be addressed. In many cases, the construction of a new plant provides an increased market for a product. This is true in the case of the goat meat processing plant. Thus, it would be remiss not to include the value of production in the analysis of the economic impact. This is especially true in cases like the goat meat processing facility where the goats may not be sold if a new market is not developed. Therefore, each plant size analysis will include a discussion of the associated production.

The first plant scenario considered is one with the capacity to slaughter 12,500 head per year. The direct value of the production of 12,500 goats is $437,500. This leads to a total economic impact of $666,264. Production of this number of goats employs 54 people. Another 3 jobs are created as a result of spending by the industry. Thus, total

employment attributable to goat production is 57. Goat production also increases tax revenues by $27,886 under this scenario, as shown in Table 3.

The processing plant will have sales of $966,000. It will employ 6 people. Table 4 shows that sales from the plant will increase economic activity by $957,817 bringing the true total state impact of the plant to almost $2 million. In addition to the 6 jobs at the plant, another 13 workers in Georgia will be employed due to the creation of the plant. Finally, the plant will increase state and local tax revenue by $50,000.

Table 3. Impacts of 12,500 Goat Production

	Direct	Indirect	Total
Output	$437,500	$228,764	$666,264
Employment	54	3	57
Tax Revenue (State)	NA	NA	$27,886

Table 4. Impacts of 12,500 Capacity Plant

	Direct	Indirect	Total
Output	$966,000	$957,817	$1,923,817
Employment	6	13	19
Tax Revenue (State)	NA	NA	$51,574

The second plant scenario is one with a capacity of 17,500 head per year. The value of this level of production, as shown in table 5, is $612,500. Due to this production, another $320,269 of sales exist in the Georgia economy. Thus, the total economic impact of the production of 17,500 head is $932,770. Directly, 75 people are employed to produce these goats. This leads to a total of 79 people being employed in Georgia due to goat production. Goat production contributes $39,040 to state and local government, non-education tax revenues in this scenario.

A plant with 17,500 head per year capacity will have sales of $1,352,400. Its employment will be 7 people. Table 6 illustrates the impact of this plant size. In addition to its direct output, the plant will generate $1.3 million in additional sales. Thus, the total impact of the plant in Georgia will be $2.7 million. In terms of employment, a total of 25 new jobs will be created due to the plant, 7 actually at the plant and 18 in other various sectors. Tax revenues for the local and state government will rise by $70,000.

Table 5. Impacts of 17,500 Goat Production

	Direct	Indirect	Total
Output	$612,500	$320,269	$932,770
Employment	75	4	79
Tax Revenue (State)	NA	NA	$39,040

Table 6. Impacts of 17,500 Capacity Plant			
	Direct	Indirect	Total
Output	$1,352,400	$1,342,124	$2,694,524
Employment	7	18	25
Tax Revenue (State)	NA	NA	$70,012

The third scenario examines a processing scenario of 22,500 head annually. Production of this number of goats directly generates sales of $787,500, as shown in table 7. Indirectly, another $411,775 of sales are created, thus bringing the total value of goat production to $1,199,275. Production of 22,500 head employs 96 people in Georgia. Their production creates 5 more jobs, bringing total employment associated with goat meat production to 101. Tax revenues (state and local non-education) associated with this level of goat meat production are $50,195.

Capacity of 22,500 head per year will create sales for the plant of $1.7 million and employment of 8 workers. Table 8 outlines the output, employment and sales impacts. A plant of this size will generate a total of $3.5 million in new sales for Georgia. Of these, roughly half will be from the plant and half from other sectors in the economy. A total of 32 new jobs will be created, 8 at the plant and 24 in other areas of commerce. State and local government tax revenues will increase by $90,000.

Table 7. Impacts of 22,500 Goat Production			
	Direct	Indirect	Total
Output	$787,500	$411,775	$1,199,275
Employment	96	4	101
Tax Revenue (State)	NA	NA	$50,195

Table 8. Impacts of 22,500 Capacity Plant			
	Direct	Indirect	Total
Output	$1,738,800	$1,720,961	$3,459,761
Employment	8	24	32
Tax Revenue (State)	NA	NA	$91,685

The fourth and final scenario is a plant with 30,000 head capacity. Production of 30,000 goats directly has a sales value of $1,050,000, as shown in table 9. These sales, in turn, generate additional sales bringing the total value to $1,599,033. Production of 30,000 goats per year employs 129 workers. Due to the operation of production, another 6 jobs are created in Georgia. Thus, the total employment associated with goat production is 135. Tax revenues attributable to the production of 30,000 goats are $66,927.

A plant size of 30,000 head annually will generate sales of $2.3 million and employ 10 people. Table 10 highlights the impacts of this 30,000 head plant. The $2.3 million of direct sales will trigger $2.4 million in additional spending. The total economic impact will then be $4.7 million in Georgia. Employment in Georgia will

increase by total 41 jobs, 10 at the plant and 31 in other industries. Tax revenues for the local and state governments will increase by $117,000.

Table 9. Impacts of 30,000 Goat Production			
	Direct	Indirect	Total
Output	$1,050,000	$549,033	$1,599,033
Employment	129	6	135
Tax Revenue (State)	NA	NA	$66,927

Table 10. Impacts of 30,000 Capacity Plant			
	Direct	Indirect	Total
Output	$2,318,400	$2,376,533	$4,694,933
Employment	10	31	41
Tax Revenue (State)	NA	NA	$116,801

Table 11 is designed to compare the four scenarios. The total output, employment and tax revenue increases (production and processing) are shown in the table. One can see as plant size increases, the size of the impacts also increase. This is due to the increase in sales by the plant.

Table 11. Comparison of Impacts (Production and Processing) for Various Sizes			
	Total Output	Total Employment	Total Tax Revenue
12,500 Head	$2,590,081	76	$79,460
17,500 Head	$3,627,294	104	$109,052
22,500 Head	$4,659,036	133	$141,880
30,000 Head	$6,293,966	176	$183,728

Conclusion

Based on the number of ethnic groups migrating to the United States, specifically the Southeast, an emerging market appears in ethnic goat products. Goat meat is one of the largest consumed meats in the world and yet very little goat meat can be easily found in the U.S. meat market. This offers an opportunity for those producing goats to enter the market and create guidelines and grading requirements for processed goat meat while potentially creating a market structure suitable for the producer to retain a large portion of the sales price. This would stabilize the prices received by the producers and reduce the volatility formed by brokers. Adding a consistent quality and quantity to market would show dedications to the product and increased sales. Developing a brand name for quantity and quality would take time, most brand names take years to develop, but would be crucial in maintaining a financially efficient Georgia goat meat processing plant.

The cooperative would need to police themselves and practice firm goat raising restrictions. Patience in entering the market, but demonstrating commitment, would be necessary for this group to be successful. This group has a competitive advantage over other areas in regards to land, breed, experience, location, and market. The land used in

goat production in this area has adequate grazing and shrubbery to produce sound animals. The Boer goats currently being used produce better quality meat and often grow quicker than other breeds. The location serves many purposes. The location is centralized in an area that can offer low quality forages suitable for goats such as low price, farm by-products (peanut hulls, soybean hulls, cotton trash), easy access to major highways promoting their meat, and low urban sprawl rates. Many of those consuming goat live in major cities with restriction of livestock production in the city limits and processing regulations. This goat meat facility has the infrastructure available to delivery goats across Georgia, South Carolina, and Florida within a day's ride. This ensures fresher product and wide market space.

The financial outlook for the proposed goat meat facility shows a positive return, although marginal based on the 450 head per week processing. Increasing the head per week will raise the profitability of the plant and spread some of the costs among the increased animal units. The learning curve of the plant could improve the efficiency and thus lower costs.

Based on this the analysis, financial and market, the researchers feel this plant could be successful if it follows its plan of only being in business to provide income to the goat producers. If the plant wished to run for profitability alone it may not be worth the risk. However, it is the premise that the plant wished to operate in order to create a market for goats produced in the community at a "fair" price. Limitations exist with this feasibility model. No one can ever accurately quantify the market demand surrounding goats or know how and when this market will change. Also, the cost can fluctuate on the strength of the economy, so prices can move affecting profitability. This is a low profit margin plant so it may be more sensitive to the general economy versus other plants. Any profits made should be saved for working capital for the next fiscal periods until large enough reserves exist to cover costs if prices drop or costs increase.

The Center for Agribusiness & Economic Development

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

> To provide feasibility and other short term studies for current or potential Georgia agribusiness firms and/or emerging food and fiber industries.
>
> To provide agricultural, natural resource, and demographic data for private and public decision makers.

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

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Gale Buchanan, Dean and Director