

**FINANCIAL FEASIBILITY OF A
2500 SOW WEANED PIG OPERATION**

by

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B.S., University of Missouri, 1981

A THESIS

Submitted in partial fulfillment of the requirements

for the degree

MASTER OF AGRIBUSINESS

Department of Agricultural Economics

College of Agriculture

KANSAS STATE UNIVERSITY

Manhattan, Kansas

2008

Approved by:

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ABSTRACT

Lone Tree Farms, Inc. is a diversified agricultural enterprise located in Harrisonville, Missouri. Since operations began in 1962, the hog operation has been expanded to the present size of a 2500 sow farrow-to-wean operation. The results of the thesis research lead Lone Tree Farms believes that there are economic and efficiency reasons behind adding to the existing farrow-to-wean operation with a 2500 sow farrow-to-wean operation.

The thesis confirms and reveals several points. First, the project takes between 9 months and a year to complete. Some of the inputs required are eight more personnel and an additional 90,000 bushel of feed grain per operating year. Approximately 3,000 gilts are utilized to stock the project and building costs of approximately \$3.5 million dollars will be accrued. The total costs of developing the project will be approximately \$4.25 to 4.5 million dollars before the first pig is sold (2007 US Dollars).

Many risk factors affect the outcome of the project, including risk of high grain prices due to ethanol, labor needs, environmental issues, and manure utilization needs of the project. The spreadsheet model that was developed as part of this thesis reveals that low productivity of the sow herd is the greatest risk factor for the success of the project.

Reducing pigs weaned per sow from 11.0 to 8.5 would lower projected return on equity from 32.7. to 7.6% and increase the cost to produce a weaned pig by \$8.72/pig. A major change in both corn (over \$2.50/bu) and soybean meal (over \$200/ton) price would be required for feed cost to have a similar impact on the cost to produce a weaned pig.

The start-up and initial production year pose the greatest challenges and risks. After that, production flows should reach more consistency and effectively lower the risk. The initial start-up capitalization of approximately 30% reduces exposure and liquidity risks. The timing of the project should be made when both input expenses and output prices (pig price) are able to be managed. Combined with good management which maximizes pigs/sow weaned, the project stands a very good chance of being considered successful.

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ACKNOWLEDGMENTS

The author wishes to thank all those who were actively involved in the formation of this thesis. Those include faculty, thesis committee, proofreaders and MAB staff. Thank you.

To those family members not actively involved in the formation of the thesis but who sacrificed time and treasure so that the author could be involved in the MAB program and subsequent thesis, thank you, thank you. Especially, wife Peggy, sons Devin, Landon, and Caleb, son Jared and daughter-in-law Rachel, and my father-in-law Ted Zellmer who has been an encourager and supportive in everything that I have ever attempted. Blessings to you all.

CHAPTER I: OBJECTIVES

The plan for this thesis is to develop a business plan which reveals the costs and strategies and physical needs in developing a 2500 sow farrow-to-wean operation for Lone Tree Farms, Inc, a diversified farm located in Cass County Missouri.

Lone Tree Farms, Inc, consists of different enterprises which offer a symbiotic relationship to the proposed expansion project, namely a cattle enterprise which may utilize the nutrients from manure produced on the proposed expansion and a cropping enterprise, which not only utilizes manure for nutrients, but also supplies corn and soybean production which makes on-farm milling possible. Lone Tree Farms also has in place a 2500 sow farrowing operation so the proposed expansion would be a doubling of the herd. There would be some efficiency captured from this doubling, such as spreading personnel management over more animals and more efficient utilization of the feed mill.

The details and cash flows outlined in the proposal will be quite helpful to Lone Tree Farms in the decision of; if, or when, to expand the sow operation.

Changing costs of production and, to a lesser but significant extent, building and production systems make a current evaluation valuable. To develop a business plan with these costs and different production scenarios explained by cash flows, with current markets in mind will enable Lone Tree Farms, or any other potential producer to make an informed decision about expansion or primary entry. The business plan will not be comprehensive, but will strive to be an example that one may use to benchmark or comparison in developing a project of one's own. Following a resources section, the thesis

will contain prospective project issues that will need to be addressed. In order, the sections will be:

1. Risks of production in operating a sow unit
2. Risks of inputs and outputs
3. Location and site selection factors
4. Building considerations and costs
5. Labor needs
6. Finance and payback expectations
7. Explanation of variables and benchmarks used in spreadsheets
8. Financial spreadsheets with various pricing scenarios
9. Explanation of results and summation.

Many of these items could lend themselves to a full thesis evaluation, but the purpose of this thesis is to give an overall idea of the major inputs needed to develop an operation and not reflect an exhaustive body of information on the swine industry. The thesis should be a good working tool in the hands of the decision-maker and give a current cost picture of the farrow-to-wean segment of the swine industry.

1.1 The Resources

The information required to inform and substantiate data offered to the reader on the thesis topic(s) will be mainly agriculturally based. On the topic of site selection, ag-engineering principles will need to be followed, along with thoughts about set-back and prevailing winds. The various agriculture extension divisions of Land Grant Universities have much information to offer and, along with a check with the regulations published by the

individual states Departments of Natural Resources should insure compliance. Building type and effluent management are affected by these regulations as well. The ideas about types of buildings will be suggestions influenced by current industry offerings and standards. Attention will be paid to pig capacities and flow requirements, though, because they will apply to nearly any structure chosen. In reference to costs and cash flow expectations of buildings, an industry average will be offered on the type of building suggested. Bids from various building companies will be gathered and reported (sans name of company) so figures will be as current as possible. Information will also be given on a per-sow basis, so a “bid” will be easily updated. Most companies heavily involved in agricultural building construction can give a per-sow bid with good accuracy according to their last construction experience.

Personnel needs will be suggested, but only in general with ideas about positions needed (managers, team leaders, technicians, etc) and general salary expectations for these positions. Current periodicals and agriculture employment companies will be good resources for these approximations.

Financing and payback expectations will be evaluated with financial institution guidelines in mind and some salient financial ratios will be calculated. The expected scenarios of production will be examined by various cash flows, which will be adjusted to differing scenarios and the results reported.

In conclusion, this thesis will attempt to be a working feasibility study with a general overview of expectations presented. After presentation, the reader should be able to walk

away with some numbers that will enable a good decision on what resources and amount of time will be needed to participate in the construction and operation of a start-up farrow-to-wean operation.

CHAPTER II: RISK FACTORS AND AVOIDANCE

In the production sector of the swine industry, there are many inherent risks. Some of these risks, such as costs of inputs (grain, feedstuffs, semen, and even liquid propane) can be lessened by forward pricing. Other risk factors can be insured against. Insurance on buildings, personnel, and livestock revenue coverage fall into this category. The risk of rising interest rates may be dealt with by choosing a fixed rate product when financing.

The greatest risk factors of a farrow-to-wean operation, however, cannot be dealt with traditional risk management techniques. Production losses due to disease, personnel mistakes, extreme weather, or the potential loss of market (contract default) are, for most operations of this type, the greatest risks that defy traditional control methods. As with most risks such as these, avoidance is the most effective means of control. There are some means to insulate an operation from the brunt of the risk that will help keep the operation in business if a difficulty occurs. Avoidance and control of the three greatest risk factors independent of typical market risk avoidance tools are discussed below.

Disease and its aftermath is the most prevalent risk for the farrow-to-wean operation. PRRS (Porcine Reproductive and Respiratory Disease), Mycoplasma Pneumonia, Influenza, and Circo-virus are diseases that can affect a sow herd and its production to the point of extreme economic loss and possible business failure. PRRS, in particular, can be devastating to an operation as it is estimated that PRRS costs U.S. pork producers as much as \$560 million each year (Miller, 2006).

Avoidance of diseases through proper bio-security (discussed in more detail in other parts of this thesis) is the most effective and necessary method of risk avoidance. To protect the business, a necessary level of liquidity should be maintained to continue cash flow in spite of a disease outbreak. Each operation should design a plan for maintaining operations in a worse case production interference scenario. Reserve funds may be set aside for this purpose. These funds may be in notes, liquid assets, capacity within a line of credit, or in collateral that may be utilized through borrowing, or a combination of these.

While PRRS and related diseases may cause this extreme need for emergency capital, other production losses may cause the need for emergency capital at a lesser percent. Production losses may occur through lesser diseases, reproductive failure, failure of personnel, or even weather (i.e. heat) related losses. If a production drop does occur due to an extreme disease outbreak, some ready cash should be available to assist with cash flow. An example would be a PRRS outbreak. A 25% loss of production for three months due to PRRS would cost approximately \$130,000. This would cover the initial costs, but some lingering production problems may continue to affect the operation for a time. The impact on an operation, from Lone Tree Farm's experience may be as much as ten percent of gross. Lone Tree has found that cash or liquidity availability needs may be as much as \$150,000 in its operation. This is about one full month's income. Proper management and oversight of an operation can ameliorate many of these potential losses and at least minimize them.

Loss of market through a customer reneging on a contract is the third risk possibility. Lessening of this risk is possible by selling to multiple customers and taking time to research the financial strength of the entity to which the operation is marketing pigs.

Meeting the customer on a personal level and putting a face to the contract will also help that person to follow through on the contract commitment. Good and ongoing communication is also helpful to keep problems and miscommunications from occurring.

The potential of a financial loss due to contract default is really only present at a low in the finishing hog market. When prices are high for finishing hogs, a buyer can be replaced if one is lost through contract default. When lean hog prices are low, however, it is a difficult time to negotiate a contract. It seems that either there is great demand for weaned pigs or very little demand for weaned pigs so timing of negotiations is critical in achieving acceptable results.

If a contract default does occur at a difficult time in the hog cycle, it may be ill-advised to be reactionary and commit to long-term agreements that may last, and cost the operation for years to come. Lone Tree Farm's management has learned that patience and accepting some short-term losses, if possible, may be the best option. History shows that the most difficult pricing periods are relatively short-lived.

Other potential risks that may affect the development plans for a unit are negative public perceptions of confinement operations and possible legislation of production techniques. Actions that may help with these social risks may include education of the voting populace on the viability of gestation stalls as good production practice, research to validate and improve accepted production techniques, lobbying legislatures and informing them of facts on the issues, and also building confinement buildings that may be converted to pen gestation production if necessary.

The regulatory risk of odor and dust nuisance legislation and manure applications also fall into this category. Wendy Powers of Iowa State University states; “Pork producers need strategies that are readily available to implement because we may see more air regulations come into place in the future.” Proper application techniques must be maintained and have proper oversight. Moving away from lagoon manure storage to deep pits under buildings will also help in the insulation of producers from nuisance issues. This method has less odor nuisance risk to the operation than lagoon storage. Information on evaluating and controlling odor may be found at www.extension.iastate.edu/airquality/practices/homepage.html or in a multitude of university publications from many land grant universities (Powers, 2006).

In the proposed operation for Lone Tree Farms, buildings will have deep pit storage to eliminate that lagoon odor risk. The buildings will also have some crate gestation, but will be built in such a way that they may be converted to full pen gestation if legislation determines that crates will not be allowed.

Cash needs will be considered when planning payback of expansion and the time frame for amortized payback will be structured to allow some liquidity within the operating line of credit and cash inflows rather than push payback to the point that no cash is available for emergency use. Excellent, experienced management will be hired and the area of labor expense will not be compromised in order to lessen potential production losses.

Lastly, biosecurity will be taken into account on all decisions made, in order to lessen the risk of importing a potentially devastating disease.

The areas of risk for non-input areas of production are difficult to ascertain and plan for. Allan Lines, Ohio State economist relates, “Although there are sophisticated methods for estimating risk, it is not so easy to establish the probabilities of receiving a specific price or the likelihood of a disease outbreak”, he says. “The age-old, farmer-proven method of underestimating receipts and over-estimating expenses-at least 5% for each-is referred to as risk-based budgeting, and is a useable and useful mechanism for accounting risk” (Miller, 2004).

The areas of risk that do not have specific risk management tools to use have only the tools of caution and preparation to assist in overcoming them. These areas mentioned, however, should have equal attention paid to them as the risks that have risk management tools.

CHAPTER III: ADDITIONAL RISK-INPUTS

3.1 Feedstuffs and Hog Prices

In addition to the difficult to define risks of the proposed expansion in producing weaned pigs such as disease and other production losses, and loss of markets, there are some risks that are more definable and have specific risk management tools available to use.

The risk of rising feedstuffs prices, namely corn and soybean meal, are in the past, more definable due to prices having both a historic and recognizable supply and demand curve. These commodities, though, are in what seems to be a new era due to new uses of both corn and soybeans in the energy market rather than the feed market exclusively. New supply and demand curves are being determined and historical prices are of lesser value when determining possible price/risk scenarios than they have been in the past.

Risk, for the proposed operation would be defined more specifically as high corn prices and low hog prices. Both of which would negatively affect the profitability of the operation. Cash flows for a new operation built in the midst of the shift of corn being used from the food sector into the energy sector should take those additional risks into consideration and must include these new frontiers of prices in order to be accurate.

3.2 Corn: Feed vs. Ethanol

The move from number 2 yellow corn from a livestock feed to an ethanol plant input has been swift. According to Lester Brown of the Earth Policy Institute, there are estimated to be 200 plants in the planning stage at the end of 2006, which could drive corn-for-ethanol use in the 2008-09 marketing year to about 139 million tons (Brown, 2006).

This unprecedented move toward drawing a commodity into the ethanol industry could cause major disruptions in the flow of grain to, and the profitability of many hog finishing operations, to which feed costs are their highest cost input. Al Hubbard, director of the National Economic Council (NEC) who is coordinating the White House energy policy, recently predicted ongoing announcements that would show the current administrations commitment to energy independence (Hubbard, 2007). This announcement by Hubbard would seem to suggest that corn will for some time be continuing its front runner role in the focus on alternative energy sources. The futures price for March, 2010 is nearly \$6.00 at the time of this paper (April, 2008), so Hubbard's anticipations are being borne out.

The debate of the necessity to continue the current ethanol subsidy of 54 cents per gallon is ongoing, but has extreme political stamina. There is hope, however, that the political clout that ethanol production has garnered is somewhat tempered as prices for food have increased in various parts of the world. Though there are only indirect ties between the use of corn for ethanol and the rising prices of staple food grains such as rice and wheat, political attention has tied the two more closely together and the results should diminish support for ethanol from corn and its subsidies.

Another challenge that will help slow ethanol plant growth is availability of water for production in drier areas such as Nebraska and the High Plains, and pressure from environmental groups, such as the Minnesota River Summit. That group met in New Ulm and voiced concern over the rivers hydrology being affected by the corn-based ethanol industry. They also do not want to see corn planted on marginal and conservation lands (Gunderson, 07). Seeing some pressure on the ethanol industry gives hope that ethanol

production and its corn usage will again come into a balance with the pricing and needs of the livestock industry.

3.3 By-products

The hope initially cast to livestock producers from the ethanol industry was that inexpensive by-products available from ethanol production would alleviate some of the losses due to higher corn prices. However, the initial results of research into the efficacy of including wet or dry distiller's grains in hog rations have not borne this hope out. From Webster City Iowa, nutritionist Gene Gourley, told the Senate Agriculture Committee during testimony on the issue that there were a number of issues involving the introduction of ethanol by-products in swine rations including "inconsistent quality, variability in nutrient content, and the potential presence of mycotoxins". The ability to utilize but a very small percentage of these products in swine rations is another problem. The DDGS product is far more useful in diets for beef and dairy cattle. It is apparent that distiller's products will not alleviate the increase in production cost for pork producers caused by high corn prices (Gourley, 2006). More information on nutrient profiles of distiller's products is available from the University of Minnesota on its DDGS Web site at www.ddgs.umn.edu.

CHAPTER IV: ENERGY, ETHANOL, AND THE PRICE OF WEANED PIGS

4.1 The Law of Unintended Consequences

The chronological beginning of the chain of consequence was nascent in low corn prices. Since 1972 until 2006, the average price of corn for feed as stated in statistics from the NASS was \$2.36 per bushel. This average corn price, over the 30 plus years in its formation, inspired corn growers to petition congress to install a subsidy on ethanol to encourage development and investment in the ethanol industry. Congress complied and the subsidy accomplished its purpose well. The addition of the demand for corn for the newly expanded ethanol industry caused corn prices to double in the 2006-2007 growing year.

This rise in feed costs has hurt U.S. producer's profits but has especially negatively affected the Canadian producer, whose cost of imported grain from the U.S., more than doubled. This problem was exacerbated when Canadian packers, who owned much of their production, cancelled contracts with independent producers. These battered producers had few options. They could export finished animals to the U.S. packers, which would net them only a few dollars per head over trucking costs or begin selling their production as weaned pigs, which, though sold at a loss on the open market, caused less red ink than market animals. Obviously, few in Canada wished to buy the pigs, so they were sold to U.S. finishers who filled their finishing floors with both Canadian and U.S. pigs. Oversupply of these pigs contributed to the downward pressure on pig prices.

To recap, so far, because of the subsidies on corn based ethanol, we have:

1. ethanol plant construction
2. higher corn demand
3. higher corn prices
4. a damaged Canadian packing industry
5. oversupply of weaned pigs to the US
6. lower domestic pig prices

In the past, the price of oil has not been a significant factor in determining pig prices but has become a salient factor in allowing the weaned pig price to be affected to an extreme low. Because of the increasing demand worldwide, the limited capacity of refineries, problems with transportation of both crude and refined products, and issues with currencies, the price of crude oil has risen to record highs.

There are some possible direct implications of higher energy prices, but the sleeper effect is the trailing connection of soybean oil, which for the most part, follows the trend of fossil fuels. As the price of crude oil rises, in 2007-2008, the funds speculators have responded by purchasing the soy complex on the futures. These purchases have the effect of increasing the soy oil and soybean prices. The price of soybean meal follows and soybean meal is typically the second highest use feed ingredient for finishing hogs. Weaned pig buyers are affected on the expense side by this price increase.

The net effect is:

1. oil prices rise
2. price of soybeans rises
3. soy oil increases in demand and price
4. soybean meal follows suit as fund buyers purchase the entire complex
(soybeans, soy oil, and soybean meal)
5. feed costs are higher and buyers price this into price paid for pigs

4.2 Boon and Bane - Currency Exchange Rates

Another factor that is currently playing into the pricing structure of open market weaned pigs has the distinction of being both a boon and a bane to the pricing. The low value of U.S. currency as compared with other currencies, particularly the Euro, is priced into the market. Import goods, such as Canadian weaned pigs, have effectively been lowered in price received by Canadian producers and discounted to U.S. buyers.

“Adding to their (Canadian producers sic) woes, the relative exchange rate causes the price of their imported goods (mostly feed grains) to rise +30%. Exacerbating the situation is the monies received in US dollars from their fire sale of market hogs, feeder pigs and weaned pigs south of the border is also depreciated by that same +30%” (DePietre, 2006).

The boon of the exchange rate pressure is that exports are cheaper on the international market (pork exports) so the huge supply of pork from the burgeoning supply will have a home. Imports will be more expensive, so U.S. goods should show increased domestic demand.

Obviously, there is an opposite effect on goods imported to the U.S. as the U.S. dollar weakens. Those goods take more dollars to obtain. If a country has domestic production to take up the slack, all is well, but, as with the case of oil, it simply makes that product draw more dollars out of the offended economy.

The weaned pig market is affected more and more by these relatively distant instigators. Small changes in an overseas commodity can have implications, even in a market on a local level (attempts to enhance market pricing through subsidies on ethanol imports being one example). Import duties can bring huge and unintended consequences on the local market. Timing of international trade action is crucial. An import duty on ethanol which keeps domestic prices “artificially” high also continues to keep the domestic price of corn at a higher level than may have been expected without an import duty. Couple this action with the current case of a hyperactive corn/ethanol market teamed up with successive short wheat crops in both hemispheres, the falling price of the dollar which makes our “over-priced” ag commodities cheap internationally, and the extreme rise in oil prices and the related fall-out, make for a perfect storm of short crops with high demand. This perfect storm of factors, teamed together, make for a drastic environment for pricing of weaned pigs on the open market which is exhibited in price volatility.

4.3 Meat Protein Demand

The length of time that it will take for the laws of economics to return corn to a level acceptable to pork producers can be but a guess, but for the next few years (2008-2010) it appears that the energy (ethanol) demand will accept high corn prices. There is a bright spot on the output side of pork production, however, as the outlook for relatively high

prices for pork seems to be positive. Increased plant demand due to more packing plants coming on line will help support prices. The continued strength of domestic demand and exports demand for hogs should also be strong for most of that time frame. “Export demand has been consistent and U.S. pork exports will set an annual record after 2006 that continues for the 15th consecutive year”, indicates Steve Meyer of Paragon Economics, “Shipments to Russia (+137%), Korea (+56%), Hong Kong (+154%) and Mexico (+23%) have more than replaced the reduction of trade with Japan” (Meyer, 2007 pg 1). This shows a strong and diversified export demand which should assist prices for hogs to remain solid for some time.

“Exports have made it possible to grow the herd 0.8 percent a year for the last 20 years”, says Glenn Grimes of the University of Missouri, “The last time we saw a decline in pork production was in 2000.” In 2004, the U.S. slaughtered a record number of hogs. This year (2005) will be the 6th year of growth and the 5th year of record production. Next year (2006) is on target to set a 6th record, he notes. An amazing number that shows the growth of exports is that U.S. net pork exports equaled 532 million pounds carcass equivalent in 2003. In 2005, it was 1.636 billion pounds (Grimes, 2006).

Other situations which are keeping the industry from expanding and therefore keeping prices relatively strong are increased construction costs, circovirus (or other) disease outbreaks, increased regulation and paperwork to build, and higher fuel costs. These factors are keeping producers wary and tentative to expand.

With this environment of higher corn and soybean meal and strong demand with limited expansion, the business plan for Lone Tree Farms will contain cash flows for the next few years that will contain higher input prices and at least average expectations for price received for pigs and cull sows.

CHAPTER V: LOCATING THE PROPOSED OPERATION-BUILDING AND OPERATIONS CONCERNS

5.1 Bio-security, the Premium Concern

The location of a hog unit demands attention to several details, but assuming that local ordinances and proper zoning driven set-backs from neighbors are observed, then only a few outstanding issues remain. Bio-security concerns, manure storage and application concerns, and environmental concerns remain at the forefront.

Bio-security must be addressed, along with location, as the ability to control disease is the premier value in any confinement unit. Locations which avoid proximity to other operations and up-wind locations are highly desired. Within a quarter of a mile, disease transmission is easily possible by aerosol and insects or rodents. If an operation can be located upwind of other units with a half-mile setback, then some semblance of bio-security can take place. In some hog dense areas, the close proximity is typically compromised to enable use of land currently owned and desire to apply manure (fertilizer) on that production land. This practice should be considered carefully as the risk factors may easily overshadow potential gains and efficiencies.

The basic ability to control transmission of disease by aerosol, insects, rodents, personnel traffic and ancillary traffic (feed, semen, and general deliveries) must be afforded in an operation of high investment. Setback from a road that carries “pig traffic” must be considered also and buffer devices such as hedges of tree windbreaks may be effective to utilize.

Disposal of deceased stock must also be considered as many disposal methods may introduce disease pathogens to the farm. Rendering trucks and burial of dead pigs is fast being replaced with composting and mechanical composting in order to keep disposal on-site and more controllable.

It cannot be stated strongly enough the need to maintain a bio-secure area for pig production. The next consideration for the location of a farrowing unit on the micro (on-farm) level is the general lay of the land with proper slope for drainage yet availability of a large level building site. If a lagoon that is gravity fed is in the site design, the buildings will need to be placed at a higher elevation. Placement of buildings in relation to prevailing winds is sometimes necessary for proper ventilation functions. This should be taken into consideration, along with proper set-back from roads and yet offer access to service vehicles.

Further consideration for the utilization of effluence (fertilizer) must be given. This high value by-product of pig production must be afforded attention and proper application techniques must be used, which is both proper in the eyes of regulatory agencies and proper for full utilization of nutrient value. Utilization by the unit owner(s) or even the sale of the effluence to neighbors is highly desired, especially as prices of commercial fertilizers have risen.

In each instance listed above, Lone Tree Farms meets the desired specifications as the nearest hog operation is five miles distant and down wind, set-back is adequate from

heavily traveled roads, and manure application opportunities are close at hand and adequate in size for best management practices.

Typically, close proximity to delivery sites would also be a high value, but in the case of pig production, location demanded by bio-security outweigh any efficiencies that may be accrued by locating close to delivery sites and other more pig dense areas which carry a higher disease risk. This point cannot be understated, and if proper bio-security methods cannot be followed in the placement of facilities then the project should be relocated, in spite of the efficiencies of utilizing pre-owned land and manure value on pre-owned land.

A related issue of using lagoons for the storage and elimination of some manure nutrients should be considered carefully as the nuisance factor of employing this technology may put an operation at risk for nuisance lawsuits and fractured neighbor relationships. The use of lagoons is seemingly decreasing due to the inability to capture full value of high value nutrients in a lagoon system and the aforementioned nuisance risk. A farrowing operation, such as the one which Lone Tree Farms currently owns produces manageable quantities of manure which may be stored in deep pits under buildings, which is becoming Lone Tree Farm's recognized method to save nutrient value and lessen environmental impact. The value of the manure as a fertilizer is considered as an asset of the unit and appropriate usage needs to be assessed for maximum value.

5.2 Building Location Considerations-Strategic Placement-Financial Reasoning

There are other location considerations that are of a long-term financial nature as opposed to a logistical, bio-security nature. The risk of locating a confinement operation within an existing farming operations physical plant exists. It is not unusual to locate confinement

buildings in close proximity to current operating hog buildings or grain-handling systems or feed mills. While this method of location may be efficient in terms of production and oversight, it may actually increase risk. If the situation occurs that a hog operation unit must be sold due to difficult financial circumstances or changes in operational priority or even inability of ownership to continue operations, the location entwined with other operational entities may lower the resale value. A lender, reviewing the solvency of the operation may discount the operations value because of its package appeal being burdened with unwanted machine sheds, grain storage, or even the family home.

This may be avoided by, if possible, placing the operation on a saleable site which is appropriately located away from other farming assets. A site with good bio-security, access to water, good roads, and near to several acres of cropland for manure utilization should be considered. The ability to divide off 20-40 acres with the building site and not disturb other parts of the operation will have good resale value, which is what a lender may be considering when setting current collateral values. Any considerations in planning a confinement unit that will increase resale value should be evaluated and pursued. Some minor inefficiency due to a locating the unit away from current facilities will be outweighed by the financial leverage gained by insightful placing of the proposed unit.

Lastly, included in resale and collateral risk, is the state regulation that may exist that limits resale of an existing unit. Some states currently have regulations limiting corporations from ownership of agricultural real estate. This would limit sale of a confinement asset to other individuals and lessen the potential purchasing pool and, therefore, potential value. Opportunity to lease the operation may still exist, but having all options open, including

outright sale, brings the most value to the collateral base and retains maximum solvency capacity.

5.3 Building Costs and Considerations

The cost of building confinement livestock facilities has increased along with the cost of materials and labor. In addition, buildings offered today are typically more complex than those in the past with more extensive environmental controls, more labor saving devices such as cool cells, and higher cost, but longer-lived equipment installed.

This has resulted in a higher price tag that demands better management to obtain necessary results for payback. The risk of a new operation is quite high in the first few start-up years.

To help offset some of these rising costs, there have been some design changes that do not affect production, but are less expensive to construct. Kirk Brincks, of Hog Slat, Inc. tries to reduce the overall cost of a building project by recommending that producers put more hogs under one roof. This allows for fewer of the expensive computerized environmental controllers, less cost for feed systems, less cost of ventilation, and even smaller factors such as number of electrical service boxes and breaker panels needed per sow inventoried. In farrowing, larger rooms (56 vs. 24 sow rooms) help lower costs without sacrificing results.

With these efficiencies in place, construction costs are still trending higher. To construct a 2500 sow production unit, a range of \$1300 to \$1550 per sow space should be planned for, though sow unit costs are quite variable depending on what region of the country the unit is built in. There is a range of \$900 to \$1550 per sow depending on where it is located and the manure handling system that's involved (Brinks, 2007 p.16).

There are further considerations when planning the construction of a sow facility. After the bio-security situation and the desired pig flow needs are assessed, proper engineering of the buildings is an important need. Always use an engineered building which has been “signed off” on to avoid insurance issues. Make sure that the concrete and its reinforcement is adequate for the project. Consistency is important and Lone Tree Farms has, in the past, checked the “slump” (hardness factor) regularly during the building process. Make sure that all materials used are quality and up to the abuse that a livestock building suffers. Anything that touches manure or the fumes from a building must be made of proper materials to withstand that environment. This includes plumbing, electrical components, all exposed surfaces (including, and especially the ceiling), and even the doors must be made for livestock passage and exposure.

Other costs that can easily be overlooked are the cost to cover walkways, the cost of office and personnel space, water procurement and piping, electrical service provision, manure handling equipment, feed milling and delivery equipment or costs, driveways, gravel and rodent control around buildings, possible fencing needs for the unit (and a lagoon, if it is designed into the unit), and production equipment purchase costs (i.e., pregnancy testers, pig processing equipment, semen storage equipment). Plans to haul the pigs away from the unit on weaning day must be made and the equipment to do so must be provided. A tractor and hydraulic pig cart or a long loading ramp is recommended as backing up to the farrowing house door with a trailer would be a bio-security risk. That same tractor will be needed to mow the area and possibly blade snow from the driveways and graveled

employee parking lot. A complete scope of project should be offered by the builder that outlines their responsibilities. Most include an office and some hallways in the bid.

Lone Tree has received bids of \$1000 per sow and \$1200 per sow from reputable builders which does include the office and some hallways. Neither contains a bid for a farrowing feed system, which some producers would desire. This range of figures would cover a basic barn with complete mechanical ventilation (with cool cells) and deep pit manure storage for the gestation and “pull plug” shallow pits in farrowing, which then drain into the deep pit gestation unit. The gestation unit in this bid would be stalls, as opposed to pen gestation.

It takes some time and effort to review the scope of work documents from the builder, but it is time well spent and will raise thoughts of other possible needs and expenses for the proposed operation. Lone Tree Farms has many of the ancillary needs in place and typically plans on spending about 2% of the project value in providing non-equipment set-up monies for a project.

The building sizes that are necessary for the desired pig flow are 392 crates for farrowing (56 crates per room in 7 rooms) and 2200 crates for gestation. Space will also be necessary for gilt acclimation and cull sow storage. Some extra crates are needed to overlap sows on weaning day. The newly weaned sows need to be held somewhere while the rooms are washed before re-loading. Acclimation space of 250 gilts is needed and cull sow space for at least 100 sows is preferable. It takes 80 sows to fill a semi and hauling may be bid into the price of the cull sows, if the farm can provide a full semi load.

5.4 Labor Needs

Labor in the pork industry has been described by many producers as a pressing production issue facing the industry. The availability of experienced labor for confinement units is practically non-existent in some regions of the U.S. This lack of available, trained personnel can result in possible production losses due to inexperienced people asked to exhibit skills within weeks of hire that often take years to develop. A rapid turnover of people is another detriment to consistent performance. People are much more mobile within jobs than in the past and there is a more prevalent attitude that if they are not moving up in a company quickly, that there is a need to move to another job to gain upward mobility. This mentality sometimes enables people to obtain positions for which they are not qualified. Personnel management at Lone Tree Farms is aware of this occurring and recognizes that a person who was a manager with responsibility at another operation may not be truly qualified. It is also wise to plan for employee turnover by developing good training techniques and systems. Lone Tree Farms has utilized printed training material and employee handbooks for many years and has found them to be very useful in the training and expectation arena. Having personnel that are trained as trainers has also been beneficial. Lone Tree Farms experience has been that much of the management staff is longer term but the technician positions (discussed later) experience more turn-over. Because of this, the systems and connections to find good replacement employees should be in place and people must be cross-trained in several positions so they may be reassigned to cover personnel shortages when needed.

With this environment of turnover in mind, the practice of employing willing, available, foreign-born workers makes good sense. The swine industry is becoming more dependent on foreign-born laborers each year. Thus, large production systems may need to be aware of the paperwork required to employ foreign-born laborers.

The labor needs for the proposed operation are concentrated in the two main areas of production for a farrow/wean operation, that is, breeding and farrowing. Breeding technicians who are trained in artificial insemination and estrus detection are the most important personnel to hire carefully. A trained person who has the ability to detect estrus and understands the breeding technique is very valuable. Some of the four member breeding crew may be inexperienced, but it is very helpful if two of the four have some experience. The breeding technicians should be people who are patient with good animal skills. These people should be selected with these skills in mind and their personality should match the need. A fast-paced, hard driving, goal-oriented person may be a good match in farrowing, but might become impatient in breeding. Personality or giftedness assessments such as the Meyers-Briggs Assessment or the DISC Assessment have been proven to be useful when assessing potential personnel at Lone Tree farms. A love for animals also tends to make a good breeder so hiring people who purposefully surround themselves with animals tends to be a good move. If they have animals; however, they should not have pigs of their own due to bio-security concerns.

Farrowing will need four technicians as well. Lone Tree Farms' experience has been that there is more latitude in personality differences when hiring farrowing people as opposed to breeding, but it is they important that farrowing personnel be detail-oriented. Farrowing

requires a large range of skills and while a breeder needs to do only two things well (insemination and estrus detection), the farrowing person must be multi-faceted. Ability to remember a complex system and keep many details in order requires a person who has a varied skill set.

Typically, another person, the manager, would be needed, but in this proposal, that position is not included as Lone Tree Farms has management in place with the existing operation to cover that need.

The manager must possess a good knowledge of pigs and production as well as have adequate people skills to manage the eight person crew that it will take to run the unit. Experience is very valuable in this position and if the starting salary for a technician is \$25,000 plus benefits, the manager may be worth twice that, depending on region and living costs in the area.

Even people at the upper end of the wage scale are becoming increasingly difficult to find. Employee management consultant, Don Tyler, expects that issue to remain the same short term and even intensify in the future. Tyler says that companies are pulling employees away from the livestock sector and college graduates have more options than they've had in the past. For example, this spring he spoke to a Purdue University agriculture economics class where 18 of the 20 seniors had job offers paying \$40,000 or more, plus benefits. Tyler also works with operations that utilize immigrant labor. Those operations are tough on themselves to make sure that they are doing everything right when it comes to immigration. Operations that already experience high turnover, that don't do their

homework on background checks, will continue to have trouble with immigrant labor (Tyler, 2006, p.17).

With these thoughts in mind, it pays to treat valuable people as well as possible. Turnover costs more in production losses and cost of personnel replacement costs than does paying a good person a few thousand dollars more per year than the current accepted rate in an area. Lone Tree Farms has found this principle to be true.

5.5 Finance and Payback

The financing of an investment of this magnitude is extremely important. Interest rates immediately come to mind as a cost to control but other factors are important also. The terms of payback are extremely important to the feasibility of the project as, if the payback is too short, cash flow will be compromised with too high of payments. If payback is too long, then total interest paid over the life of the loan balloons, money is consumed with interest payments as opposed to principal, and there is a danger of the loan amortization outrunning the effective life of the facility. At that point, the amount still owed on the facility may far outstrip its value. Most facilities are, on paper, depreciated out at a ten year time frame. They may last longer than ten years, but at that point, substantial remodeling may need to occur.

Lee Fuchs, vice president of capital markets of FCS Financial of Missouri, notes that a typical loan for a new facility is amortized over 10 years. Producers ask for 12 to 15 years but rarely get it. The exception may be when a large land base secures the loan (Fuchs, 2006, p.18). It is healthy if lenders hold the line on loan periods, if a producer gets in a

bind for a few years because of a short amortization, then the producer and lender will come together, discuss it and work out a solution (Fuchs, 2006).

The payback of a facility is important and financial formulas that reveal how an operation is paying off. Six ratios most significant to this paper and his description of each are as follows:

Profit Margin reveals the monies generated from the operation. $\text{Net income} + \text{interest paid} / \text{gross income}$ shows income made as a percentage of gross.

Return on Assets (ROA), shows the net income made as opposed to the asset base that it took to make that income. A high percent is a good sign that an operation is utilizing its assets to good advantage.

The asset turnover ratio (ATR) tells how much cash is being generated annually in relation to a producer's investment. It is calculated by dividing gross farm income by the average market value of total farm assets. The higher the percentage, the more efficient and profitable the operation is.

The interest expense ratio (IER) is calculated by dividing interest paid by gross farm income. The ideal standard is 15 percent or less. Operations with IERs of over 10 percent are usually highly leveraged and interest is consuming too much of the income. This would also be a prime indicator of a risky loan to an operation with cash flow issues.

The net/gross ratio is an indication of whether an operation is making any money. If that ratio is too low, an operation is simply trading dollars without much real return.

Return on Equity reveals the gross cash return as opposed to the equity held in the operation. This ratio is high in efficient operations and is measured by dividing the gross profit margin by the equity in the operation.

The pertinent financial ratios which are helpful to be examined are:

Profit Margin = net + interest/ gross	Range of 20 to 30 % is healthy
Return on Assets ratio = gross revenue/total assets	Range desirable is 25 to 30%
Asset Turnover ratio = gross income/ Asset value	Greater than 7% is good for high Investment operations
Interest expense ratio = interest Expense/ gross revenue	Less than 15% is desired
Net/Gross ratio	Greater than 10% is needed
Return on Equity ratio = gross Revenue/equity in operation	Greater than 25% is desired

In regards to financial matters, besides tracking ratios, Lone Tree Farms makes sure to avoid adding to the balance sheet with overly high building values. Maintain the reality of what the contributory collateral value of the buildings will be according to your lender. This solvency risk should be recognized as lenders may lend a large quantity to build a new hog production system and then devalue it immediately when assigning it a value for collateral on the loan. It can be a shock to find out how little value a lender attributes to livestock confinement buildings. Lone Tree has discovered that diversification into land ownership has been beneficial to assist in collateralization of loans.

If the balance of proper financing terms is employed, an operation should, according to the cash flows, be able to have payback percentages that are acceptable to the producer and lender.

5.6 Production Benchmarks

With the introduction of a cash flow spreadsheet to the decision-making process, there are some numbers that are used that bear explanation and introduction from the income side of the cash flow. It is important to keep track of certain production benchmarks which indicate profit potential and also help with diagnostics of production issues that need attention. A good computer diagnostic program is essential to monitoring a sow farm and a program and its data input time should be calculated into the needs of the operation.

As an example of the use of numbers in the operation, the numbers of pigs produced for the first year is a 52,000 pigs and some calculation has gone into that number. These are benchmark numbers that help to determine the numeric levels of production. The major benchmarks that affect productivity on a sow farm include litters per mated female/year, non-productive sow days, combined litter weight, conception rate, and farrowing rate. These are all efficiency figures that must be paid attention to, and all will be somewhat compromised in the gilt start-up herd, as opposed to the producing, mature sow herd. These challenges to the start-up herd will be taken into account in pig production numbers. Pig Champ, a large record keeping and data service for the swine industry; publish productivity measures from their records which are good tools for comparison. The following table is an example of some of the production benchmarks and some of the relevant levels of production that may be expected in a sow farrowing operation.

Table 5.1 Production Benchmarks for a Sow Farm

Productivity Measure	Mean	Upper 10%	Lower 10%
Pigs weaned/mated female/year	19.1	23.3	17
Non-productive sow days	74	47	103.5
Weaning age, days	18.2	21.1	15.2
Farrowing rate, %	75.6	84.8	64.1
Number born alive	10.3	11.1	9.5
Average sow parity	3.5	4.3	2.7
Preweaning mortality	13.4	8.7	17.7
Multiple matings	83.4	99.5	66.7
Sow mortality	7.8	3.2	13.1

Source: 2003 data from 199 U.S. farms, Pig Champ Datashare summary

The numbers represented in Table 5.1 represent the mean, low, and high numbers in each category, not the numbers for whole farms in each category. Restated, the upper 10% number represent the most efficient numbers in each category, but a farm with poor production may actually have one really good benchmark number and therefore be represented in the upper 10% category.

The numbers used in the proposal will be, from experience, not from the upper 10% on the productivity scale, but, if good management is in place, neither will they be at the mean level, except for non productive sow days, number born alive, weaning age, and multiple matings, which will be at the mean level due to the nature of breeding so many new breeding females. After the initial, start-up year, many numbers in the upper 10% of the Pig Champ herds should be attainable (Pig Champ 2003 data).

The other number on the income side, along with the pigs produced per year is cull sows. The number and price of the cull sow line on the cash flow will be small the first year in production as most culls will be smaller, younger animals, with none culled for age. The

numbers will increase in the second year as the herd matures and less productive animals will be culled to allow for incoming breeding females. At the point that a mature herd is in production, the replacement rate for sows is often at 45 to 50% of the herd, depending upon genetics. This would mean that as new breeding females are brought into the herd, the same number of sows will leave, less death loss.

Number of gilts introduced in the construction year is obviously high, and that number continues to be elevated in the first year of production as culling of less productive animals and fragile first parity (first litter) animals occurs. Production deficit culling should be fairly aggressive during this time frame to avoid a “bubble” that need to be culled because of age (parity 7) will occur later on in the life of the sow as the initial group of females ages. Overall, production will be enhanced for the longer term if this production culling plan is carried out.

These production numbers all change as the sow herd matures from a gilt herd to a mature herd in full production and by production year 2 and production year 3, the benchmark numbers should regulate to a more consistent and maintainable level.

5.7 Inputs

Using benchmarks for inputs is not as common as using benchmarks for swine production output, but historic price levels of inputs can be used and compared with the prices paid by other producers with similar operations. A word of caution on benchmarks, the region of the country where the operation exists will often determine if a benchmark can be reached. For example, an operation in Oklahoma will have lower labor costs and higher feed costs

than Nebraska. Conversely, Nebraska will usually have higher labor costs and lower feed costs. Regional differences may exist that should be taken into account.

Table 5.2 Cost of Production Benchmarks for Breed-to-Wean Units (2005 Cost/Pig Produced-Complete Equivalent)

Expenses	Percentile	
	50th	90th
Personnel	5.50	5.00
Facilities	5.5	5.25
Other operating costs	1.00	0.90
Total cost of labor, facilities and other	12.00	11.15
Costs normally borne by contractors		
Genetics	4.63	3.8
Feed	8.61	7.31
Veterinary/medicine	1.90	1.75
Total cost of production before Administration and finance	27.14	24.01
Administration	1.50	1.50
Total cost of production before finance costs	28.64	25.51
Interest	0.39	0.16
Total cost of production, \$/pig	29.03	25.67

Source: Latta, Harris, Hanon & Penningroth LLP

As can be seen in Table 5.2, feed is the largest component of production cost. Great attention should be paid to all the variables, but efficiency with feeding typically offers the most opportunity for improvement but also the most exposure to problems in cost management because of market volatility.

In regards to the feed side of the inputs, historic prices may be helpful in determining prices to insert into the spreadsheet. The average price for corn in Kansas for the years 2003-2006 was \$3.10 per bushel (www.nass.usda.gov/index.asp). The average price for 47.5% soybean meal purchased by Lone Tree Farms for the years 2003-2006 was \$173.3 per ton. These may be used as starting points for a cash flow, though, the current state of the market

(2008) prices of at least \$4/bushel of corn and \$300/ton of soybean meal may be more appropriate for longer-term planning.

Other inputs include; the price of labor which in this example is at a \$30,000 package per person for an 8 person crew. The price of semen is at \$6.25 per dose with an average use of 2.2 doses per mating. This will be less for the gilt start-up herd which will be a little less than two doses per mating (gilts typically express estrus for a shorter amount of time, so fewer doses would be required the first year). Semen can typically be contracted for a period of time through a boar stud so prices may not vary. Another input benchmark that changes is the number of new breeding females that are added to the herd. The number of those females should be increased in May and June (assuming a 60 day acclimation) to allow for breeding difficulties and lower conception rates in July and August. This will allow pig flow to remain relatively constant which is extremely important in pleasing buyers who desire a consistent pig flow.

CHAPTER VI: SUMMARY OF OUTPUTS

Financially, the project has good potential payback as long as acceptable input prices are assured and acceptable output (pigs) is recognized. The Excel model used to run the sensitivities to various changes and scenarios has been designed to adjust for all the major variables in producing weaned pigs and operation a sow farm. A unique feature of the spreadsheet is in the input page; each month is laid out individually and tied to a futures market price. This allows the user to use the input page, which is tied to a month by month cash flow, to construct a cash flow model as well as a sensitivity modeling tool. In addition, there are, in the input page, some functional “mini” models that allow for changes in feed rations, changes in production capabilities of sows, and different sow culling scenarios, all along with the typical price and quantity changing cells to make the cash flow spreadsheet accurate and flexible. The cash flow spreadsheet connected to the input page contains a monthly cash flow, repeated over a period of four years. This enables the user to obtain, as accurately as possible, a cash flow projection that is sensitive to monthly or seasonal fluctuations in income and expenses. The spreadsheet also contains a running payback of loans line which can be adjusted for payback on principal. Lastly, the cash flow spreadsheet contains various financial ratios which adjust from the spreadsheet. This allows the user to track important financial ratios and how changes in input or output variables affect those ratios. Profit margin, return on assets, asset turnover ratio, interest expense ratio, net/gross ratio, and return on equity are the ratios shown. In the Excel spreadsheet accompanying the paper, the “options” page outlines some of these optional outcomes when inputs and outputs fluctuate. Obviously, as the highest input variable, feed (corn and soy) cost, when adjusted, causes great changes in the breakeven price for pigs as

well as in the pertinent financial ratios. The pig output, though, has an even greater effect than moderate input price increases. The need to maximize pig production and efficient through-put is essential. As noted in Table 6.1, moving pigs/sow produced from 8.5 to 11 pigs reduces the cost to produce a pig by over \$8 per pig and reduces production breakeven down to a level where profitability is more sustainable in the face of higher input prices. All the key financial ratios improve substantially with the higher production output. Profit margin increases from 11% to 37%. Return on assets increases by 23% because of the efficiencies. The scenario shows that the return on equity rose from a 7.6% return to a dramatic 32.7% return. This difference in return will be the difference between an operation that is floundering toward demise and one that is profitable and a candidate for expansion.

Table 6.1 Influence of Production Level on Economic Performance of the Farrow to Wean Operation.

Item	Pigs weaned per sow	
	8.5	11.0
Average market price, \$/cwt carcass	75.00	75.00
Average pig price, \$/pig	42.00	42.00
Cost of production, \$/pig	38.77	30.05
Average corn price, \$/bu	4.00	4.00
Average soybean meal price, \$/ton	270	270
Profit margin, %	11.72	37.36
Return on assets, %	7.00	30.7
Asset turnover, %	65.56	87.72
Interest expense ratio, %	.09	0.10
Net/gross ratio, %	10.80	37.36
Return on equity, %	7.60	32.77

Source: XLS thesis data

The impact of feed cost on the cost of production and the financial ratios is illustrated in Table 6.2. Using current (April, 2008) prices for corn and soybean meal increases the cost of producing a weaned pig by over 30% compared to using historical ingredient prices. Comparing results from different input pricing scenarios yields information in different financial ratios. The variables at the high input values are: corn, \$5.50/bushel; soybean meal, \$370.00/ton; weaned pig market price, \$42.00/pig. With these input prices, the cost to produce the pig is \$36.36. The lower input prices were: corn, \$3.00/bu; soybean meal, \$175.00/ton; and weaned pig price, \$42.00. With the lower input prices, the cost of production was been reduced from \$38.39 to \$30.57/pig.

Table 6.2 Influence of Feed Prices on Economic Performance of the Farrow to Wean Operation.

Item	Feed prices	
	Low	High
Average market price, \$/cwt carcass	75.00	75.00
Average pig price, \$/pig	42.00	42.00
Cost of production, \$/pig	30.57	36.36
Average corn price, \$/bu	3.00	5.5
Average soybean meal price, \$/ton	175	370
Profit margin, %	32.78	21.13
Return on assets, %	25.45	15.40
Asset turnover, %	83.37	83.37
Interest expense ratio, %	2.00	3.00
net/gross ratio, %	30.53	18.48
Return on equity, %	27.33	17.61

Source: XLS thesis data

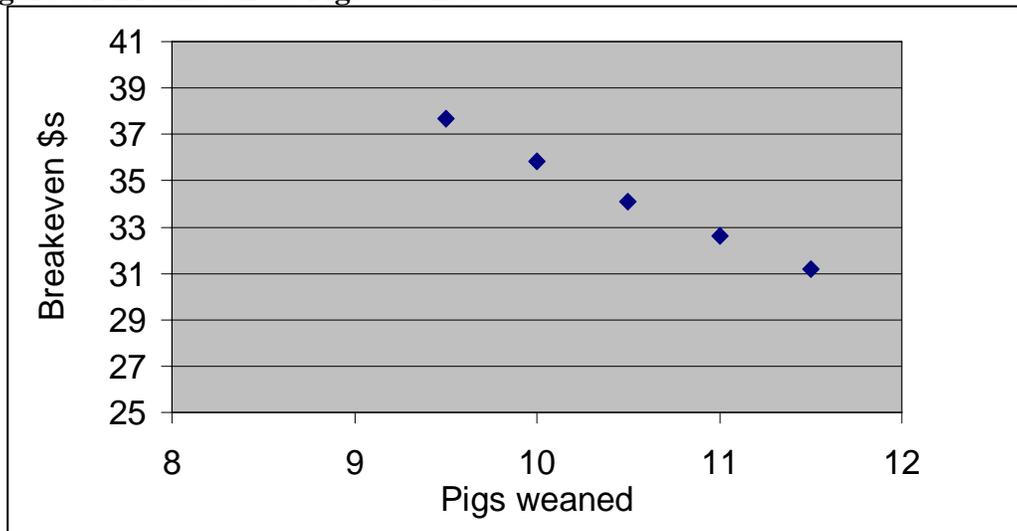
As can be seen in Table 6.2, input prices are important, but extreme differences in input prices are needed to mirror the effect that changes in production have on profitability and the cost to produce a weaned pig.

The ratios in Table 6.2 do show a dramatic increase in ROA as input costs decline. The return on equity of an increased 10% is substantial. Profit margin also increases by 11% and the Net/Gross ratio increases by 12%. The interest expense ratio shows the dramatic increase in the amount of debt that can be serviced as the input cost falls and profit rises. This dynamic is a good measure of timing for expansion using borrowed funds.

Lastly, the Excel workbook contains a loan calculator which is tied to the spreadsheet so that changes in finance terms may be easily adjusted. This will allow the user to keep accurate track of loan amortizations and allow them to impact the monthly spreadsheet.

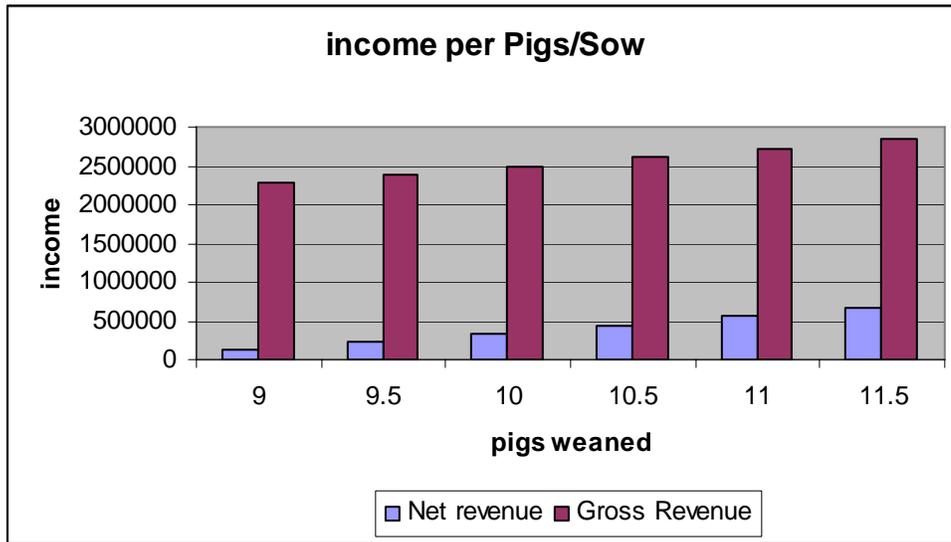
After using the input page and the spreadsheet page of the Excel workbook, many scenarios over several years were modeled. In all, most of the models showed the project has good long-term profit potential, but ongoing attention to limiting risk through managing input prices and effective management focused on maximizing production will be crucial. Once a project is complete, most expenses enter into a fairly manageable range, but the aforementioned variables will continue to determine the overall profitability of a highly leveraged new expansion project. The lack of equity in the operation and its relatively high debt load make it more susceptible to failure as opposed to an established operation.

Figure 6.1 Breakeven vs. Pigs Weaned



Sensitivities of different variables from the Excel worksheet are indicative of weaned pig operations. Weaned pig operations are noteworthy in their business and financial structure because nearly all costs are fixed costs. Other areas of producing pigs contain more variable costs than does the weaned pig operation. Because of this nearly unique structure, the weaned pig operations profitability is more influenced by pig production numbers than input variables. In figure 6.1, the number of pigs weaned increasing shows a lessening of breakeven cost on the pig. Figure 6.2 indicates the difference that pigs per sow per year has on gross versus net income. An increase of pigs per litter increases the net income greatly. This should energize the farrower to focus on production and work diligently to eliminate obstacles standing in the way of maximizing pigs weaned per sow per year (P/S/Y). Any obstacle, be it adequate and trained personnel, genetics, buildings, or production systems, must not be compromised if it inhibits production. Each pig produced as indicated by P/S/Y has great impact on the net of the operation.

Figure 6.2 Pigs per Sow per Year Affects on Income



Likewise, in Figure 6.2, the net income is affected by the largest input cost of the weaned pig, namely feed for the sow. Net Income falls as feed costs rise, but the profitability of the operation is not as affected by even extreme rises in input costs as it is by production efficiency as noted above in Figure 6.1. This is, once again because of the nature of the weaned pig operations business structure where most costs are fixed costs and increased production provides greater return for each pig produced. As stated in section 6.1, production of the maximum number of pigs per sow has an extreme impact on the profitability of the proposed unit. Attention to inputs costs and values are important also, but if attention that is given to reduction of input costs takes attention from maximizing production, then most likely, it is misplaced. Both must be done, but there is an order of importance.

CHAPTER VII: SUMMARY

In summary, the intent of this paper is to give the reader the ideas and considerations needed when planning a sow unit. While not exhaustive, the major variables have been examined. Buildings, labor, bio-security, inputs, risk variables, and expectations of output have been examined and some realistic considerations have been offered.

The results of the spreadsheet can be extremely variable due to the extremes in prices of inputs. The trend, however, is that an expansion of this sort, should yield acceptable benefits over time. The first few years, however, are critical in the success of the expansion. A good start is nearly essential and proper production practices and management should not be overlooked at this time. The beginning financial ratios for year 1 are acceptable under most start-up scenarios and improve as production matures.

Another beginning variable to monitor during start-up is liquidity. For the example in the spreadsheet, 70% of the funds are borrowed for the project. This 70% is a common amount in that financiers like to see about 30% of a project's capital supplied by the borrower to stabilize the financing of the project.

Creative payback timing (delay) until sufficient working capital is built back up is the mode of generating capital for short-term liquidity. The reality of an expansion would most probably require bringing some working capital to the table for the project to be viable. In this case, Lone Tree Farms has experienced that 10% might be sufficient (about \$400,000). This would help to overcome most start-up production inconsistencies and provide some needed up-front liquidity.

The development of a 2500 sow farrow-to-wean operation is a complex undertaking. It involves people, buildings, animals, highly variable inputs, marketing, and financial skill. It is akin to the development of a small manufacturing plant, and yet this is undertaken often by people who would disclaim the ability to begin a small manufacturing plant. The ability of those people (mostly farmers) to accomplish such an undertaking highlights the extreme value of experience, confidence and production knowledge base that they possess. Those valuable assets are the beginning of the resources that are helpful to accomplish a large project as mentioned, all other aspects of the project flow from those personal assets.

Farrowing out the initial gilt litters also challenge the system with initial start-up risk. Inherent problems with gilts include some lighter, less marketable pigs, some increased disease pressure such as 'scours' or 'greasy pig syndrome' and potential behavioral problems including pig 'savaging' and operational training issues such as crate adaptation. In all, the start-up and initial production year pose the greatest challenges and risks, but after that time, production flows should reach more consistency and effectively lower the risk. If the timing of the project can be made when both inputs and through-put are able to be managed effectively, then the project stands a very good chance of being considered successful.

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