ADVANCING COLORADO'S RENEWABLE ENERGY (ACRE) PROGRAM

COLORADO FEEDLOT ETHANOL PLANT FEASIBILITY STUDY

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Contents

Executive Summary

This feasibility study is premised on the fact that beef cattle feedlots in Eastern Colorado are at a competitive disadvantage because they are located more than 100 miles from the nearest ethanol plant, and as a result, they do not have access to inexpensive wet distillers grains with solubles (WDGS) for feed. This project evaluates and documents the economic impact of locating small ethanol plants in the following Colorado counties: Crowley, Otero, Bent, Prowers, Baca, Kit Carson, and Morgan. If new ethanol plants are built, significant positive economic impacts are expected for Colorado's agriculture industry and for the local communities which they will operate.

This study considers a feedlot ethanol plant producing 11.45 million gallons per year of fuel ethanol plus 89,000 tons per year of WDGS. The ethanol plant provides 17 full time jobs with total annual salary and benefits of $1.295 million. The ethanol plant consumes nearly $21 million per year in inputs, including more than $16 million in grain, most locally grown. The plant produces $27.3 million in products including $4.4 million of WDGS. And significantly, the ethanol plant improves profitability at the local beef cattle feedlots by $3 million per year, assuming 30,000 head on feed.

A feedlot ethanol plant in east-central or southeastern Colorado provides an opportunity for significant economic benefits. For the base case, the ethanol plant return on investment (ROI) is 19.2%, and when the economic benefit to the feedlot is included, the ROI is 39.1%.

Colorado Feedlots

The Colorado cattle industry is big business. An ethanol plant located near a cattle feedlot improves feed efficiency, saves money, and provides a competitive advantage for Colorado's feedlot owners. According to the Colorado Beef Council, there are more than 2.6 million head of cattle and 13,000 beef producers throughout Colorado. Nearly one-third of Colorado's counties are classified as either economically dependent on the cattle industry or having the cattle industry serve an important role in their economies. Cash receipts from the sale of cattle and calves at $2.5 billion represent more than half of the gross farm income of $4.9 billion.

Colorado Feedlot Capacity and Locations

Colorado feedlots greater than 1,000 head capacity were identified and their locations were plotted on maps. In addition, the maps include roadways, railroads, plus the locations of existing ethanol plants. Table 1 shows the name, location, and capacity for feedlots greater than 1,000 head in the study area -- Crowley, Otero, Bent, Prowers, Baca, Kit Carson, and Morgan counties.

Table 1 – Colorado Feedlots Greater Than 1,000 Head Capacity in Crowley, Otero, Bent, Prowers, Baca, Kit Carson, and Morgan counties:

Feedlot Name	**City**	**County**	**Capacity**	**Distance to Nearest Ethanol Plant (miles)**
Bath, Keith Feed Lot	Ft. Morgan	Morgan	7,000	47
Cattlco	Ft. Morgan	Morgan	40,000	51
English Feedlots	Wiggins	Morgan	32,000	55
Magnum Feedyard	Wiggins	Morgan	22,500	58
Pinneo Feedlot	Brush	Morgan	40,000	40
Teague Diversified	Ft. Morgan	Morgan	20,000	56
		Total	**161,500**	
4 M Feeders	Stratton	Kit Carson	7,500	81
Buol, John Feeding Co.	Burlington	Kit Carson	4,000	85
Burlington Feeders	Burlington	Kit Carson	18,000	90
Plains Feeders	Burlington	Kit Carson	16,000	87
Triple H Farms	Stratton	Kit Carson	4,000	>100 miles
		Total	**49,500**	
Beef City	McClave	Bent	30,000	>100 miles
Colo. Beef - Five Rivers	Lamar	Prowers	60,000	>100 miles
Four States Feeders, LP	Lamar	Prowers	10,000	>100 miles
Four States Feeders, LP – North	Lamar	Prowers	16,000	>100 miles
		Total	**116,000**	
Ordway Feedyard	Ordway	Crowley	55,000	>100 miles
Best Bet Beeflot	La Junta	Otero	4,000	>100 miles
Miller, Howard Land & Cattle	La Junta	Otero	4,500	>100 miles
Rocky Ford Feedyard	Rocky Ford	Otero	30,000	>100 miles
Timpas Feedyard	Rocky Ford	Otero	10,000	>100 miles
United Feeders	Rocky Ford	Otero	12,000	>100 miles
		Total	**115,500**	
Baca County Feedyard	Walsh	Baca	21,000	>100 miles
		Total	**21,000**	

Source: Beef Spotter, 2007.

In Morgan County, the nearest ethanol plant is in Sterling, about 50 miles away. In the remainder of the study area, the nearest ethanol plant is about 100 miles away or more.

Figure 1 – Colorado feedlots and ethanol plants greater than 1,000 head. Cattle feedlots are concentrated in eastern Colorado. Thumbtacks indicate feedlots; the first number is an index number, followed by a hyphen, followed by feedlot capacity. Stars show ethanol plants. Colorado has three ethanol plants, each located in the northeastern part of the state. See Figures 2 and 3 for more detailed views of feedlots and ethanol plants in Northeastern and Southeastern Colorado.

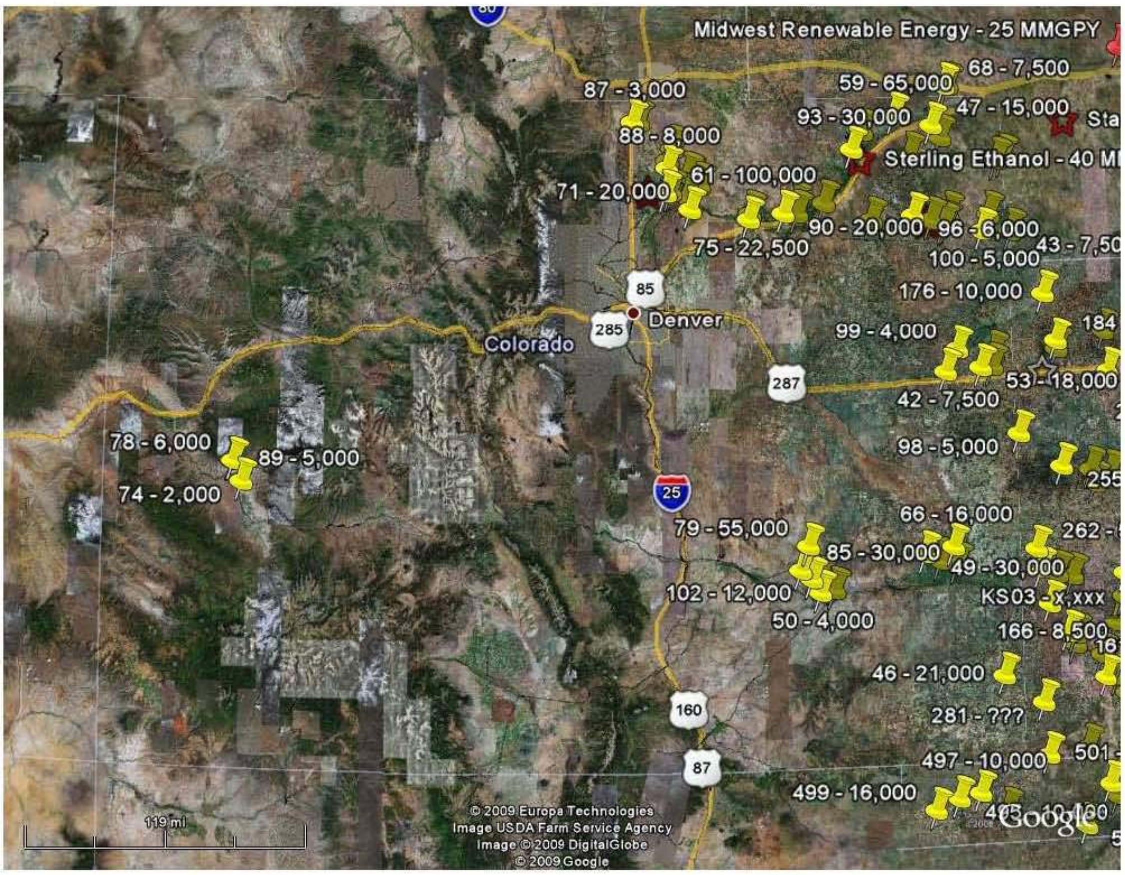


Figure 2 – Northeastern Colorado feedlots and ethanol plants. Large-scale feedlots greater than 1,000 head in Northeastern Colorado tend to follow the transportation corridors along Interstate-76, Highway 34, and Interstate 70. Colorado's three major ethanol plants (Front Range Energy, Sterling Ethanol, and Yuma Ethanol) are located in Northeastern Colorado and are indicated on the map with stars. Morgan County, near the center of the map, shows several large feedlots without nearby access to an ethanol plant for WDGS. Rail is shows as black lines on the map.

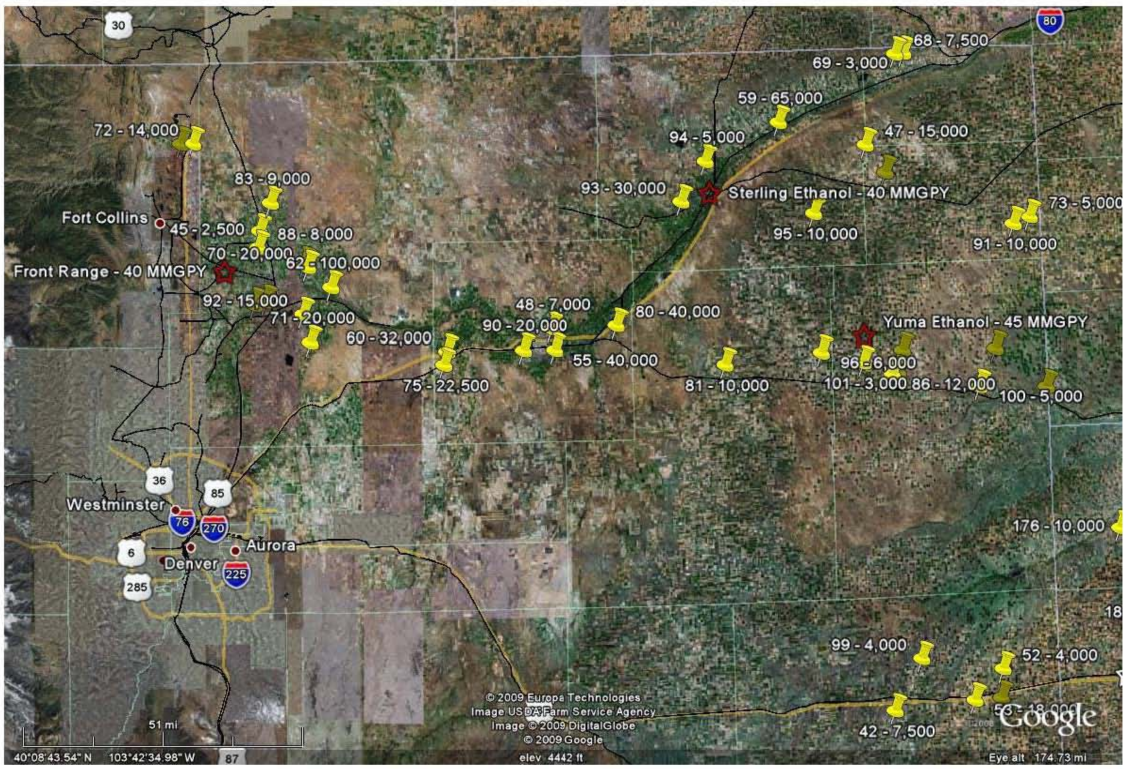
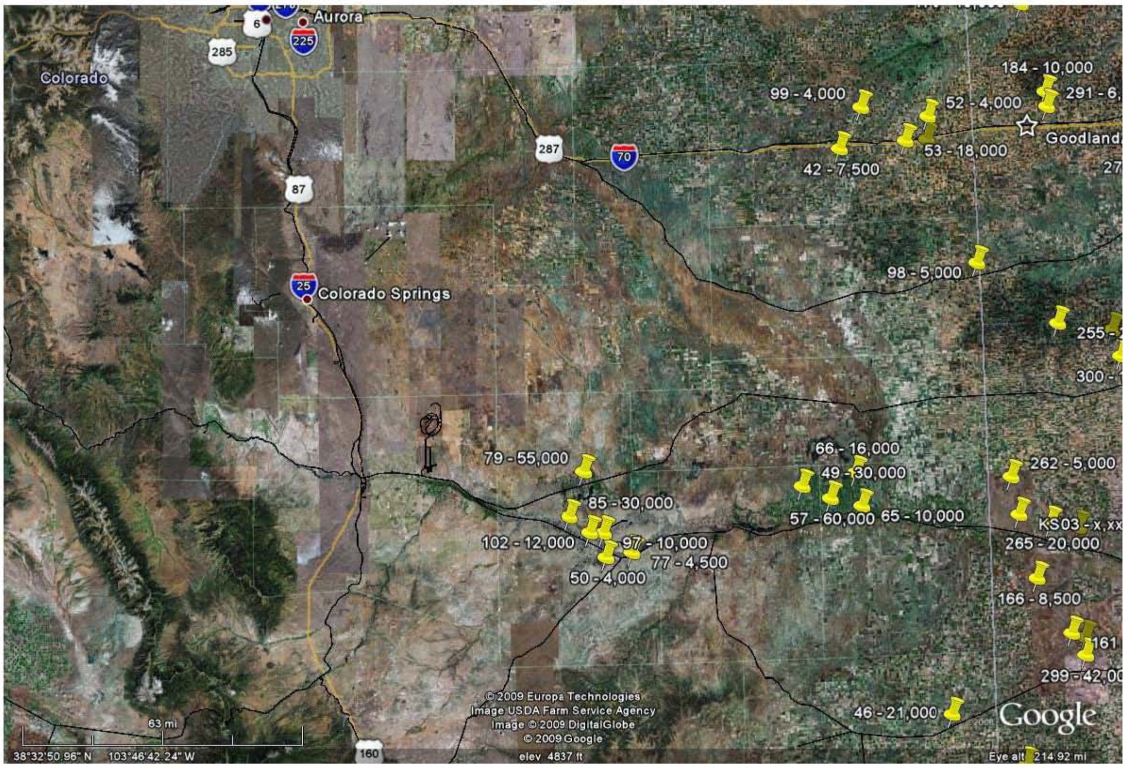


Figure 3 – Southeastern Colorado feedlots. This map shows the locations of the feedlots greater than 1,000 head in Southeastern Colorado. No ethanol plants exist in this part of the state, but nevertheless, several large concentrations of feedlots do exist. Cattle feeders in Southeastern Colorado could benefit from a nearby source of WDGS. It should be noted that just east of Burlington is an idle ethanol plant indicated by a white star; this is the Goodland Energy Center, a 20-30 million GPY ethanol plant that has never operated. Rail is shows as black lines on the map.



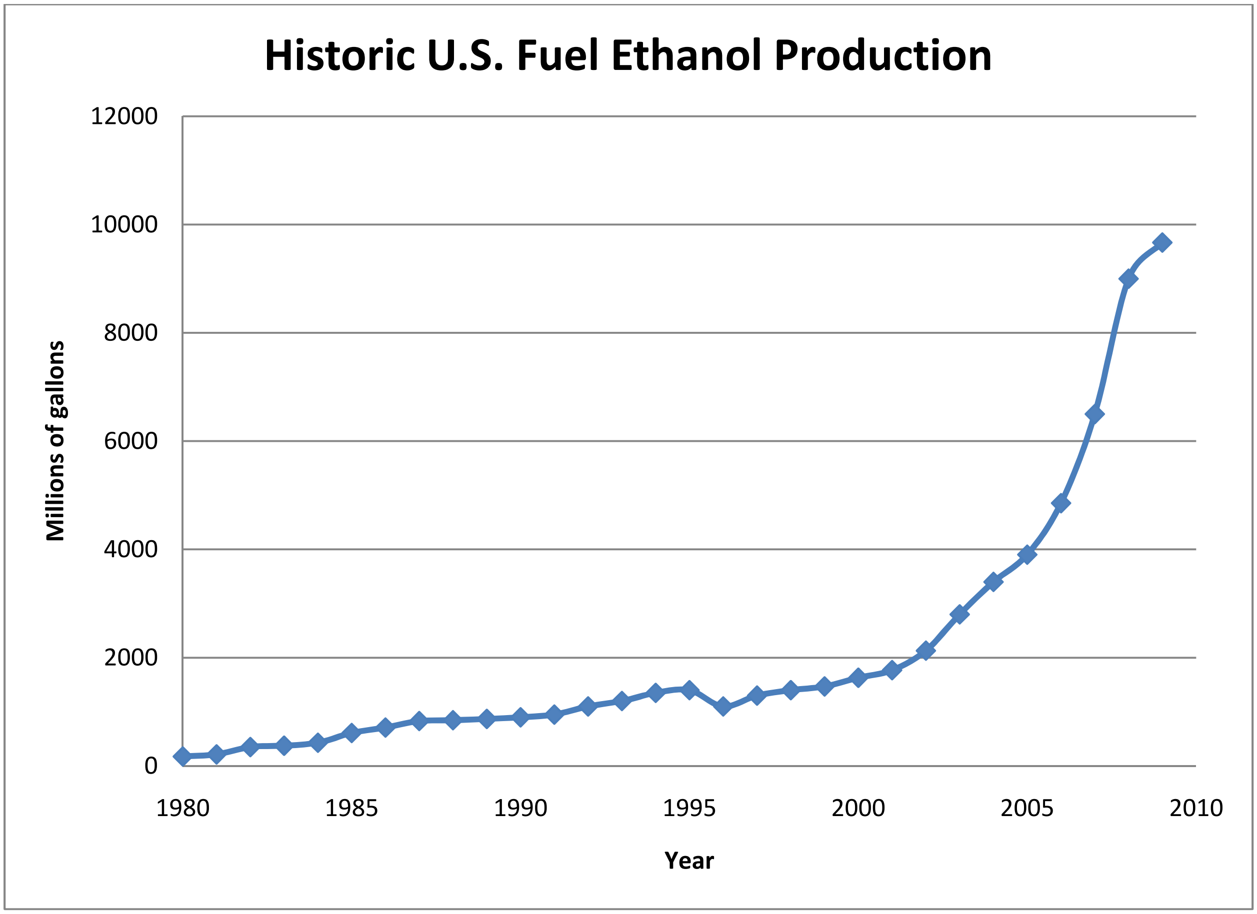
Ethanol Production

Industry Overview

The Renewable Fuels Association estimates that as of January 2010 there were 200 ethanol plants in the United States with nameplate capacity of 13.0 billion GPY. Operating capacity was 11.9 billion GPY and idle capacity was 1.1 billion GPY. Plants undergoing construction or expansion represented an additional 1.4 billion GPY. More than two thirds of the industry capacity has been built since 2001.

The USDA estimates corn use by ethanol producers during the 2009/10 marketing year ending August 31 was 4.3 billion bushels, which is up 16.9% from 3.677 billion bushels in the previous year. The USDA's estimates imply that 32.7% of the US corn crop in 2009/10 will be used for ethanol production, which would be a record high and up from 30.4% in 2008/09.

Figure 4 – Historic U.S. Fuel Ethanol Production



Source: Renewable Fuels Association.

Colorado has three major ethanol plants with a nameplate capacity of 122 million GPY:

- Front Range Energy, Windsor, 40 million GPY
- Sterling Ethanol, Sterling, 42 million GPY
- Yuma Ethanol, Yuma, 40 million GPY

As of January 2010, all three plants were operating near nameplate capacity. No Colorado plants are currently under construction or expansion. There are two smaller ethanol plants located in the state: Aurora has a 3 million GPY plant to turn waste beer into ethanol, and in the southeastern corner of Colorado, in Baca County, is an idle 3 million GPY ethanol plant located just west of the town of Walsh.

There a couple other ethanol plants located just outside of Colorado close enough to allow grain and WDGS to be traded with Colorado's agricultural producers. In Madrid, Nebraska is a 55 million GPY ethanol plant about 27 miles east of the Colorado state line. This plant has potential to sell WDGS to feeders in Sedgwick and Phillips counties. In Caruso, Kansas is an idle 20-30 million GPY ethanol plant located about 13 miles east of the state line on Interstate-70. Construction on this plant is not complete, and it is unknown if it will ever be completed. If this plant should commence operation, it has the potential to buy corn and sell WDGS to cattle feeders in Yuma, Kit Carson and Cheyenne counties.

Colorado is the 18th leading ethanol producer by state, with about 0.94% of total U.S. ethanol production capacity. Colorado produces about 1.23% of U.S. corn supply and 1.06% of U.S. grain sorghum supply. The state has about 2.22% of the U.S. beef cow inventory. These numbers suggest Colorado is an under-producer of ethanol relative to the amount of grain and beef cattle produced, and additional ethanol production capacity may be warranted.

Nutritional Impacts of Wet Distillers Grain in the Beef Feedlot Ration

Distillers grains production and utilization has increased at the same rate as ethanol production and both wet and dried distillers grains are widely accepted as a component of the feed ration by most beef cattle feeders and nutritionists today. However, variability exists in the quality and performance of distillers grains, and confusions exists with regard to what exactly is in the distillers grains.

Co-products from a traditional dry mill ethanol plant include distillers grains that are dried, modified, or wet, and with or without solubles. The distillers grain can be from corn, grain sorghum, or a blend of the two. The latest trend for dry mill ethanol plants is "dry fractionation" where the corn is separated into its component parts of starch, fiber and germ, and the presence or absence of "dry fractionation" has a dramatic effect on the co-products. And then there's the corn gluten feed co-products from wet mill ethanol plants. The number of co-products is growing and there are no recognized standards or specifications for quality and composition.

For purchasers of co-products, the market can be dangerous and confusing, and to compound the problem, the same co-product can vary from plant to plant. Even within the same plant, quality and composition of co-products can change because of variation on how the plant is operated. In a typical ethanol plant, ethanol represents about 85% of revenue and distillers grain represents the other 15%. Naturally, plant managers operate ethanol plants to maximize ethanol rates and yields with little consideration on co-products.

This leads to sub-optimization where the ethanol plant is optimized for maximum profit, and the feedlot is optimized for maximum profit, but the overall economics of converting grain into beef and fuel can suffer. For example, at the ethanol plant, in an effort to maximize production of ethanol, sulfuric acid is typically used to clean scale and fouling from evaporators and heat exchangers. The sulfur ends up in the co-products which are then typically fed to cattle. At the feedlot, sulfur can have a negative effect on beef cattle performance, and in extreme cases too much sulfur can lead to toxicity or even death.

When the beef feedlot controls the ethanol plant, the entire system can be optimized for maximum overall profit and productivity. For example, instead of using sulfuric acid, another acid that's more compatible with cattle nutritional needs can be used, like acetic acid, or another organic acid. While the alternative acid may cost slightly more, the overall costs of producing beef and fuel could be lower. This is just one example of the benefits of co-locating ethanol plants with beef feedlots. The primary benefit is avoidance of transportation costs in hauling the distillers grains. Another significant benefit is the nutritional advantage of WDGS versus DDGS, as shown in Table 2. Drying appears to reduce the feed value of distillers grain.

Table 2 – Feeding WDGS results in better performance for finishing cattle:

	Control	WDGS	DDGS
Daily Feed, lb	24.2	23.6	25.4
Daily Gain, lb	3.23	3.71	3.71
Feed/Gain	7.49	6.36	6.85

Source: Nebraska Corn Board.

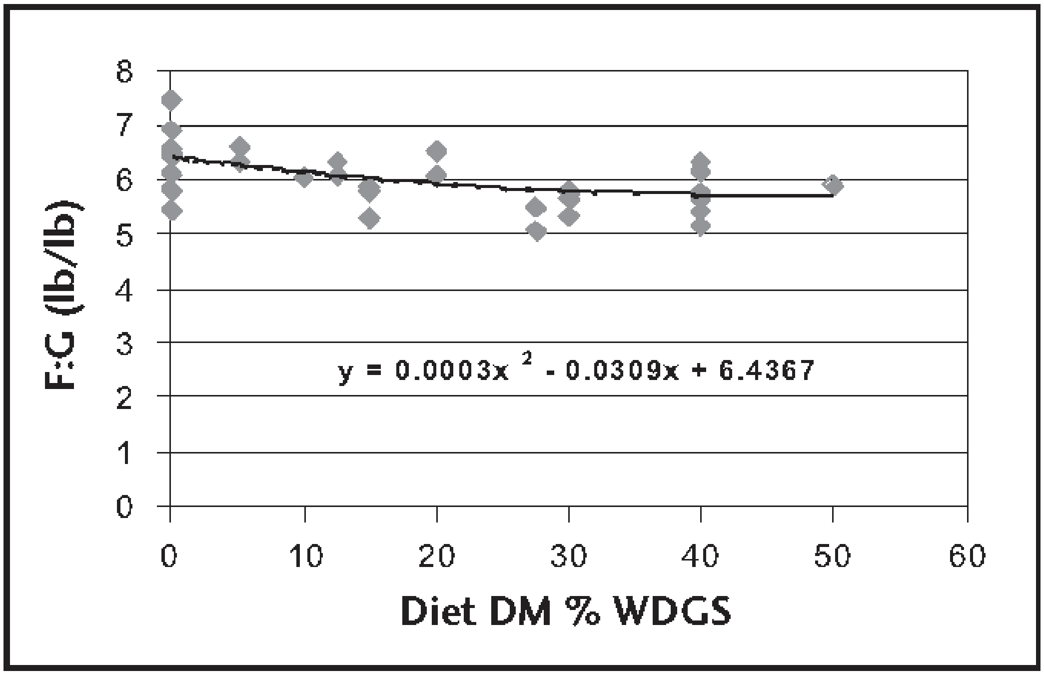
As Table 2 shows, WDGS results in a more nutritious product compared to either the control ration of dry-rolled corn or DDGS. And DDGS costs more to produce than WDGS. The primary advantage DDGS has over WDGS is longer shelf life and reduced transportation costs. Since WDGS is about 65% moisture, compared to DDGS that's about 10% moisture, it's usually cost prohibitive to haul WDGS long distances of more than 50-100 miles.

Beef cattle nutrition is a complex science. Most large beef feedlots employ the services of a nutritionist, and most nutritionists have a PhD in animal nutrition. This report will not dwell too deeply in the nutritional impacts of distillers grains in cattle diets, but it is important to have a basic understanding of the economics of including distillers grains in the cattle ration. For more information, the reader is encouraged to consult with an independent nutritionist, or read some of the excellent information provided by the Nebraska Corn Board, such as Utilization of Corn Co-Products in the Beef Industry, 2nd Edition, available for free on the Internet (http://www.nebraskacorn.org/publications/coproducts.htm)

The cost or either WDGS or DDGS delivered to the feedlot will be the primary factor in determining inclusion levels in the ration. According to the Iowa Beef Center (2007), "As a rule, adding [distillers grains at] 15% to 20% of the ration dry matter will often meet the protein requirements and contribute to the energy needs of the cattle. Higher levels can be fed when co-products are competitive with corn as an energy source." In controlled studies of beef feedlot cattle, replacement of dry-rolled corn with WDGS improves feed efficiency at all inclusion levels up to 50% on a dry matter basis (see Figure 5). Figure 6 shows feed value relative to corn for WDGS from multiple studies conducted by the University of Nebraska. The feed value of WDGS is consistently higher than corn. The feeding value at low levels (less than 15%) is about 145% of corn; when higher levels of WDGS are used (greater than 40%), the feed value is still greater than corn.

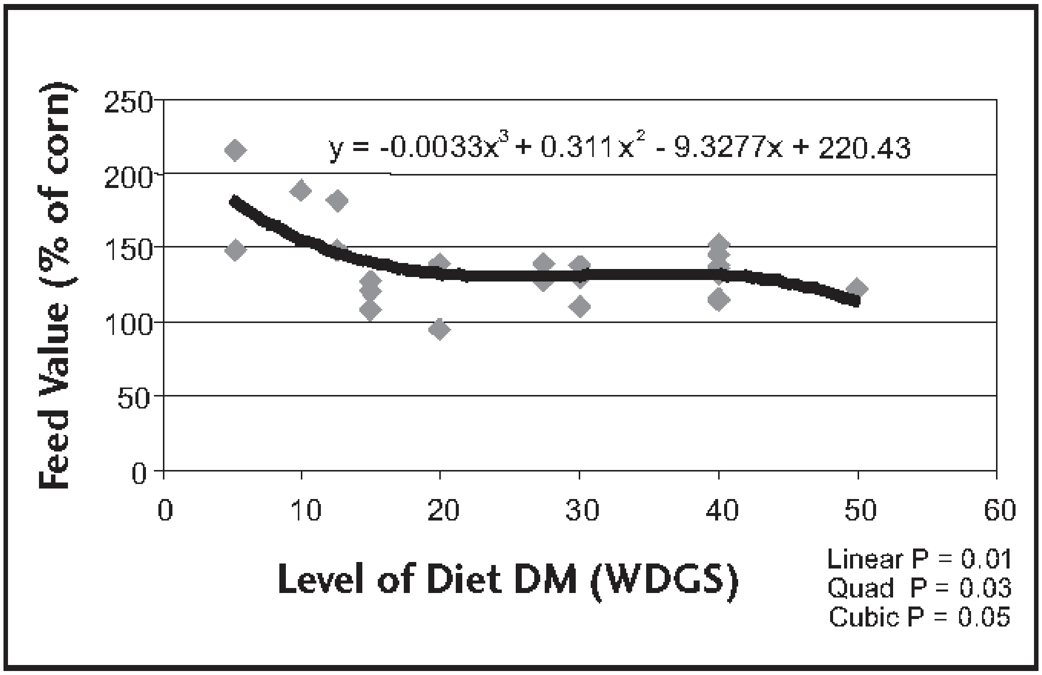
The financial analysis in this report makes extensive use of the equations shown in Figures 5 and 6 to estimate the economic impact for a beef feedlot when a nearby ethanol plant supplies WDGS. Because the feed efficiency of WDGS is always greater than corn, there is always a positive economic impact for a feedlot provided the cost of WDGS is equal to or lower than corn on a dry matter basis. Throughout the financial analysis in this report, WDGS price was set at 80% of the price of corn on a dry matter basis, which is consistent with typical U.S. market price.

Figure 5 – Feed-to-gain ratios for WDGS at various inclusion levels with dry rolled corn.



Source: Nebraska Corn Board, "Feeding of Corn Milling Co-Products to Beef Cattle," 2007.

Figure 6 – Feed efficiency for WDGS at various inclusion levels with dry rolled corn.



Source: Nebraska Corn Board, "Feeding of Corn Milling Co-Products to Beef Cattle," 2007.

It should be noted that Figures 5 and 6 illustrate the results of studies where WDGS replaced dry rolled corn. In Nebraska, where the studies were done, beef cattle feeders typically use dry rolled corn, while Colorado feeders more commonly utilize steam flaked corn. According to the Nebraska Corn Board (2008), "Vander Pol et al (2006) fed diets containing 30% WDGS with either whole, dry rolled corn, high moisture corn, a 50:50 blend of high moisture corn and dry rolled corn (dry matter basis), or steam flaked corn to finishing steers for 168 days. Cattle fed dry rolled corn, high moisture corn, or a combination of high moisture corn and dry rolled corn gained more and were more efficient than cattle fed whole corn. Interestingly, cattle fed steam flaked corn did not gain as efficiently." Optimal average daily gain and feed-to-gain ratios were seen with 15% WDGS in steam flaked corn rations.

Finally, it should be noted that since WDGS contains little to no starch, rumen acid production is decreased and the risk of acidosis-related challenges is decreased. Overall, including WDGS in beef cattle diets provides numerous benefits including improved feed efficiency, more favorable feed-to-gain ratios, greater average daily gain, and superior rumen health. Since WDGS typically sells for 80% of the price of corn on a dry matter basis, it provides a significant competitive advantage to cattle feeders with the good access to a reliable ethanol plant. A feedlot ethanol plant allows any cattle feeder with the means to build and operate an ethanol plant with the ability to gain that competitive advantage.

Feedstock Availability and Price

A 10-million GPY ethanol plant requires about 3.6 million bushels of grain per year; 2.8 gallons of denatured ethanol are produced per bushel of corn or grain sorghum. Ethanol plants operate about the same on either corn, grain sorghum, or a combination of the two. Corn is readily available in all of the areas studied for this report, and it is handled in bulk quantities by all of the existing feedlots. Grain sorghum is generally produced and available in southeastern Colorado.

Table 3 – Historic average grain sorghum production and local basis (2005-2009) for counties in the study area. Grain sorghum production is most prevalent in southeastern Colorado. Grain sorghum basis is calculated relative to corn futures on the Chicago Board of Trade.

	Grain Sorghum	
County	**5-Year Average Production (2005-2009), bushels**	**5-Year Average Local basis (2005-2009), $/bushel**
Baca	1,982,125	-$0.566
Bent	151,250	N/A
Crowley	73,750	N/A
Kit Carson	57,250	N/A
Morgan	60,429	N/A
Otero	80,286	N/A
Prowers	898,444	-$0.442
State-Wide Total	**4,948,889**	

Source: USDA NASS and www.AgManager.info.

Table 4 – Historic average corn production and local basis (2005-2009) for counties in the study area.

	Corn	
County	**5-Year Average Production (2005-2009), bushels**	**5-Year Average Local basis (2005-2009), $/bushel**
Baca	4,996,333	-$0.135
Bent	839,667	N/A
Crowley	128,250	N/A
Kit Carson	18,378,222	-$0.180
Morgan	10,100,222	-$0.103
Otero	1,419,667	N/A
Prowers	2,267,889	-$0.156
State-Wide Total	**137,152,222**	

Source: USDA NASS and www.AgManager.info.

In Baca and Prowers counties, grain sorghum is the feedstock of choice since the local basis is about $0.50 below CBOT corn. In the rest of the study area, grain sorghum is generally not available so corn is the primary feedstock. WDGS from both corn and grain sorghum provide similar performance in feedlot diets.

The impact on local basis when a 10 million GPY ethanol plant is installed is estimated to increase by about $0.05 - $0.10 per bushel. John Urbanchuk, director at LECG LLC, a global expert services consulting firm with experience in agriculture and the economics of biofuels, estimates a 40 million GPY ethanol plant will increase the local basis by $0.05 - $0.10 per bushel. There are numerous factors that influence local grain prices such as weather, year-to-year swings in production, grain handling infrastructure, the cost of transportation, and government policies including changes in export markets. Many of these factors can have a greater impact on local basis than a new ethanol production plant, but nevertheless, it is reasonable to believe that a relationship exists between additional demand for grain from new ethanol production and price.

According to Urbanchuk, the USDA estimates that in the U.S. every 100 million bushels of corn used to produce ethanol increases the price of ethanol by 3 to 5 cents per bushel. Since about 8 billion gallons of ethanol production capacity has been added in the past 8 years, by the USDA estimate, corn price should have increased by $0.86 to $1.43 per bushel, which seems reasonable given current and historic pricing trends.

In addition to the favorable price basis for grain sorghum, it also has another significant advantage over corn. Under current definitions, grain sorghum qualifies for payments under Section 9005 of the 2008 Farm Bill for advanced biofuels producers. An advanced biofuel is defined as a fuel derived from renewable biomass other than corn starch, so ethanol produced from grain sorghum meets the definition. In Fiscal Year 2009, $30 million was provided to 160 eligible producers under Section 9005 for an average payment of $187,500.

Ethanol Producer Magazine reports 14 ethanol plants use grain sorghum, and 29% of the sorghum produced in the U.S. is used for ethanol production. The United Sorghum Checkoff Program has a goal of increasing the amount of grain sorghum used in ethanol by 50% in 2011.

Researchers are working to increase crop yields, improve drought resistance, enhance nitrogen usage efficiency and boost yields within the ethanol plant for both grain sorghum and corn hybrids. For example, Dr. Dirk Hays at Texas A&M University is developing a high-yield sorghum cultivar for optimized low-energy input ethanol production and high nutrition feed. The sorghum is being developed to produce distillers grain with a balanced amino acid profile that will further improve feed efficiency at beef cattle feedlots.

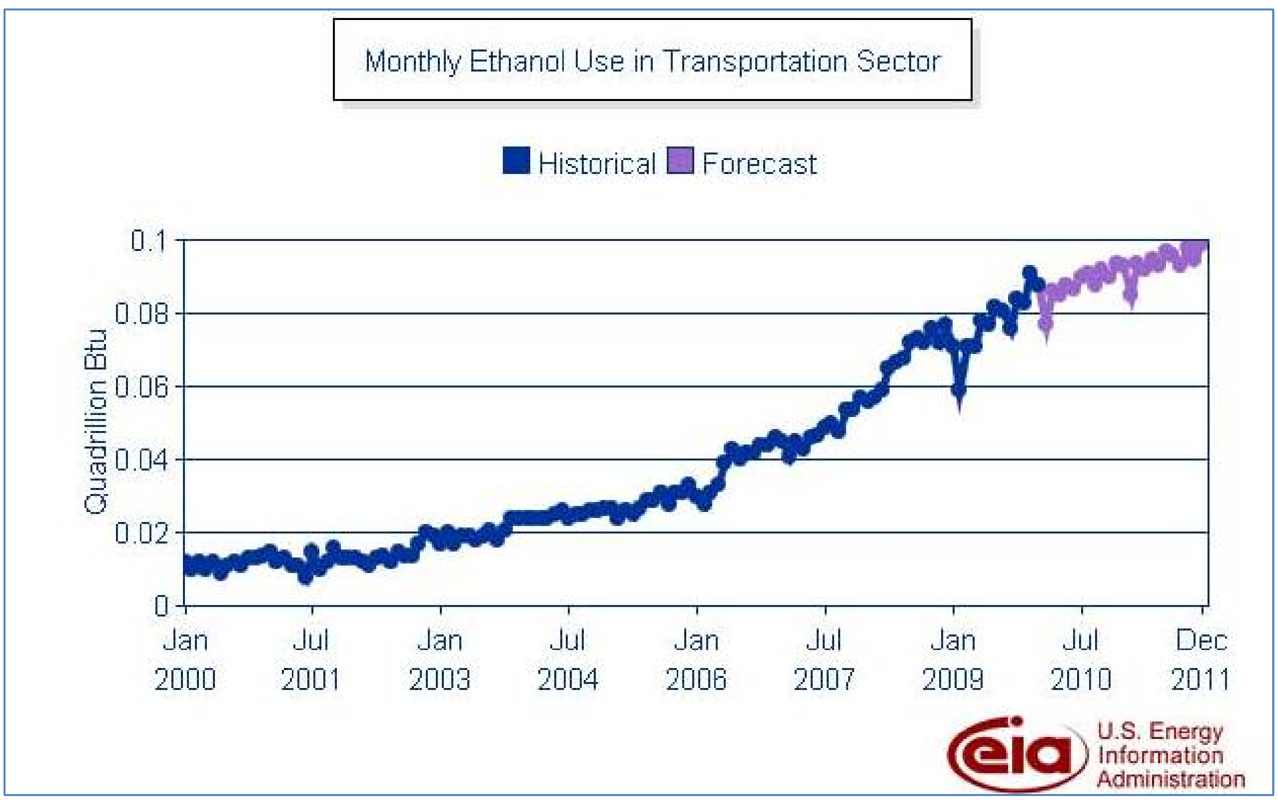
A June 2007 USDA survey indicates that the number one reason beef producers give for not feeding distillers grains is availability. Since then, ethanol production has increased dramatically and DDGS is available to most producers willing to pay the transportation costs, but WDGS, due to its high moisture content is generally available only within about 100 miles of an ethanol plant.

Ethanol Markets

Many ethanol producers utilize the services of a third-party ethanol marketing company. A variety of ethanol marketers exist and each provide services such as corn procurement, ethanol and distillers grain marketing, and risk management activities such as hedging strategies. Since a feedlot ethanol plant will typically have years of expertise in grain procurement with relationships already established with local grain producers, and since they already have a ready market for the distillers grain, most likely they will only need to contract for ethanol marketing and possibly risk management services. The advantage of using a third-party company for ethanol marketing is they already have relationships with fuel blenders, and by representing multiple ethanol producers, they represent enough market share to negotiate favorable prices on behalf of their clients. Typical marketing fees are 1% of the sales price for ethanol, or about $200,000 per year for a 10 million GPY plant selling ethanol at $2.00 a gallon.

About 99% of the fuel ethanol produced in the U.S. is used in the transportation sector by blending it into the motor gasoline pool. Throughout much of the U.S., ethanol is blended up to 10%, and in many areas 85%, or E85, is available for use in flex-fuel vehicles. The Department of Energy's (DOE) Energy Information Administration forecasts ethanol use in the transportation sector to continue to grow.

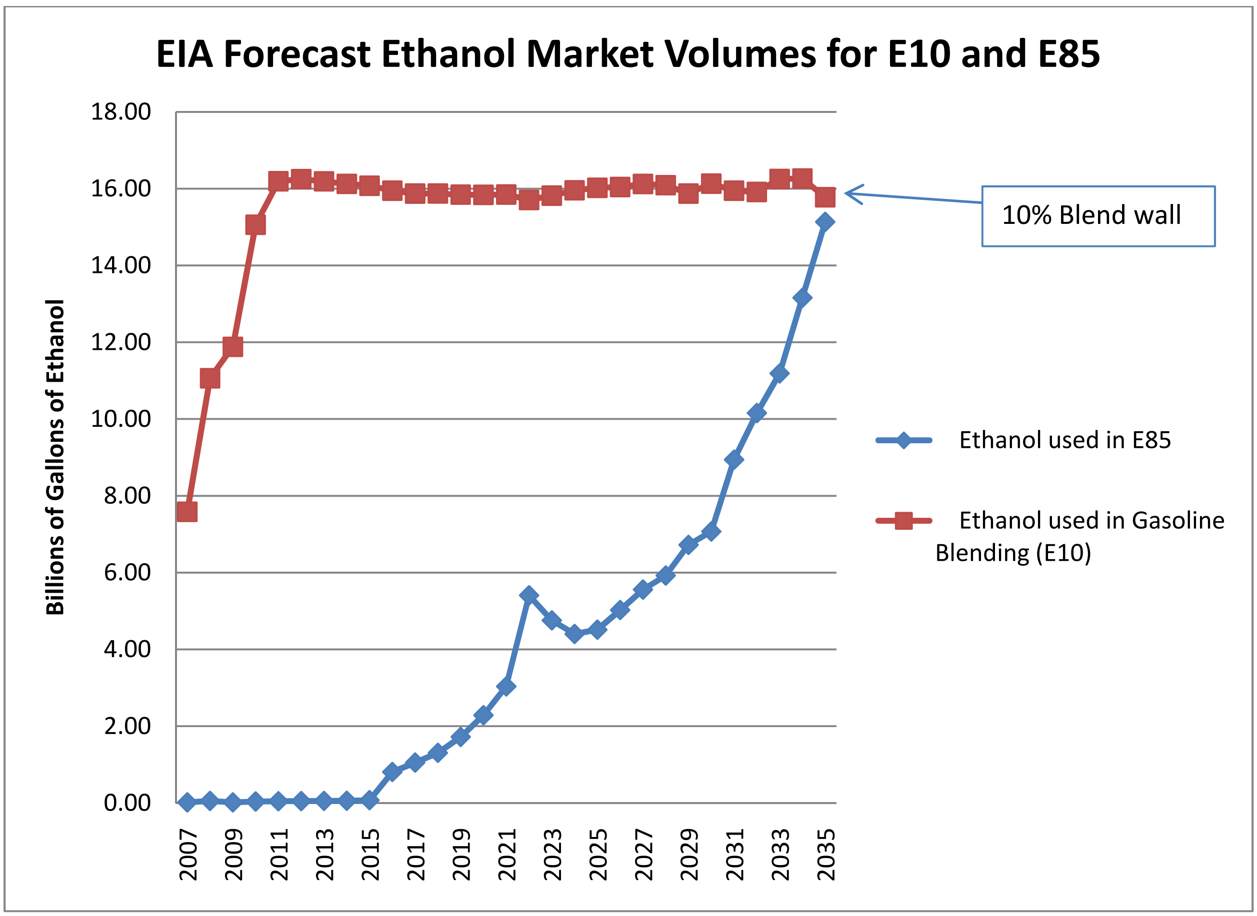
Figure 7 – Historic and projected ethanol use in the transportation sector. Note the Energy Information Administration forecasts continued growth in the ethanol market through the end of 2011.



Source: Energy Information Administration, Short Term Energy Outlook, released Feb 10, 2010.

By the end of 2011, the EIA forecasts the motor gasoline pool to be saturated at the 10% blending level (the so-called "blend wall"), and further growth in the ethanol market will occur by growing the E85 market. The federal government is expected to begin mandating that all engines be Flex Fuel. There is also an effort underway to increase the 10% blending level to 15%, or some other blend between 10% and 15%. The EIA does not seem to take into account blends higher than 10% ethanol, except for E85. The EPA is responsible for final rule making regarding blends higher than 10% ethanol, and they are currently working with the DOE on engine tests using the higher blends. Clearly, if higher blends are allowed, and when Flex Fuel engines become mandated, substantial new market demand will be created.

Figure 9 – Projected ethanol use through 2035. Note the 10% "blend wall" is expected to be reached in 2011 unless the EPA allows blends greater than 10% in the unleaded motor gasoline pool. The market for E85 is expected to grow rapidly starting in 2015.



Source: Energy Information Administration, Annual Energy Outlook 2010, released Dec 14, 2009. Data released in quadrillion Btu and converted to gallons. One gallon of ethanol contains 76,000 Btu.

In the U.S., the ethanol market is largely driven by the requirements set forth in the 2007 Energy Independence and Security Act (EISA) and enforced by the Environmental Protection Agency (EPA) as the

National Renewable Fuel Standard program (commonly known as the RFS program). The RFS establishes specific annual volume requirements for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that must be used in transportation fuel. The RFS also includes criteria for both renewable fuels and the feedstocks used to produce them, including new greenhouse gas (GHG) emission thresholds as determined by lifecycle analysis. The regulatory requirements for RFS apply to domestic and foreign producers and importers of renewable fuel used in the U.S.

On February 3, 2010 the EPA issued the final rules for the RFS. The final rules determined that corn based ethanol plants using modern design techniques and efficient technologies meet the required minimum GHG reduction standards. This was a surprise since the proposed rules issued in May 2009 indicated otherwise. This is good news for feedlot ethanol plant project developers and their customers because new plants can be built with natural gas fired boilers instead of biomass fired boilers, which saves several million dollars in project costs and improves the ROI. For more information on the final RFS rules visit the EPA website: http://www.epa.gov/otaq/renewablefuels/index.htm.

Distillers Grain

For this study, it is assumed that the feedlot owners also own the ethanol plant, and the distillers grain produced by the ethanol plant is used at the feedlot. Thus, there's a ready market for the WDGS. However, in most areas, opportunities exist to market distillers grains to other nearby cattle feeders. Typically, distillers grain sells for about 80% of the price of corn on a dry matter basis, and in the pro forma this figure was used. On a dry matter basis, distillers grain is typically about 28% protein, 8% fat, and 9% fiber. Shelf life for WDGS is 3 – 7 days, depending on weather and the use of extenders.

To meet the feeding needs of cattle on feed and dairies, ProExporter Network Publication forecasts Colorado importing 490,000 metric ton of distillers grain in the 2009-2010 season above what is now produced in the state from existing Colorado ethanol plants.

Carbon Dioxide

The CO2 absorbed by the grain crop through photosynthesis is recycled during fermentation of the sugars in the process. Markets for CO2 are generally in the food processing industry, or in enhanced oil recovery. For this report, it is assumed that CO2 will not be captured, so no value is attributed to it in the pro forma, however, opportunities may develop which could improve the economic viability of the business.

Carbon Life Cycle Analysis (LCA) and Carbon Trading Credits

In the coming years it will be important, if not required, for refiners and retailers to understand the carbon history and atmospheric contribution from the fuel they process and/or market. Regarding the carbon modeling of an ethanol plant, inputs include grain type, irrigation practices, energy use and source (i.e. natural gas boilers versus biomass [for example, biomass could be manure or crop residue]), fertilizer and pesticide practices, till or no-till practices, drying needs for the distillers grains, and a variety of other inputs unique to each site. Based on global carbon markets for emissions trading, there may be future opportunities to market GHG emissions credits. However, at this time, the markets and regulations continue to develop, so no financial consideration has been attributed in the pro forma.

Plant Description

A typical feedlot ethanol plant produces 10 million GPY fuel ethanol and uses about 3.6 million bushels of grain per year. Milo and corn can be mixed and processed together, or either can be used alone. The plant also produces approximately 78,000 tons per year of 65% WDGS, and recycles an estimated 30,000 tons per year of carbon dioxide.

The grain received at the plant will be dumped into a truck pit in a receiving building. The trucks will not be required to move while unloading. One 15,000 BPH leg will lift the grain to two 50,000 bushel storage silos. A dust collection system will be installed on the grain receiving system to reduce particulate emissions per the Air Permit application. Trucks will be weighed on a scale as they enter and exit the plant.

A scalper will be installed to remove rocks and debris from the grain prior to entering the hammer mill to grind the grain. The ground grain will be mixed with warm water and enzymes in a slurry tank and pumped through the system. Cooked mash will continue through the liquefaction tanks and into one of three fermenters. Yeast will be added to the fermenter as it is filling. After the completion of each fermented batch, the beer is emptied into a beer well, which feeds the beer column to begin distilling off the alcohol.

The distilled beer will be 190 proof when sent to the mole sieves. Two-hundred proof alcohol is pumped to the tank farm and blended with a denaturant such as unleaded or natural gasoline to render the product unfit for human consumption, then sent to a denatured ethanol storage tank. Loading facilities for trucks will be provided. Tank farm tanks will include: 190 proof storage, 200 proof storage, denaturant storage, and denatured ethanol storage. Tanks are carbon steel with floating roofs as may be required in the Air Quality Permit.

Mash from the beer column will be processed through a centrifuge to remove water. This remaining wet cake will be conveyed to the wet cake pad for truck loading or conveyed to the feedlot feed mill. Water from the thin stillage is evaporated and the remaining syrup is added back to the wet cake. A front-end loader is used to load WDGS onto trucks.

Fresh water for the boiler will be obtained from area wells. Depending on quality, the water will be treated with softeners and reverse osmosis equipment to gain cycles and prevent scaling. Depending on raw water quality, environmentally friendly chemicals may need to be added before reaching the boiler.

The boiler system will provide steam for the process. Exhaust gases from the boiler will be ducted through a stack gas economizer to recover energy from the exhaust gas stream, and then vented. The steam system will be inspected by state authorities to validate compliance.

The design will include a compressed air system consisting of air compressor, a receiver tank, prefilter, coalescing filter, and an air dryer. The compressed air is used to control air-actuated valves and to operate pneumatic tools and other equipment.

The design also includes a clean-in-place (CIP) system for cleaning cook, fermentation, distillation, evaporation, centrifuges, and other piping systems. Sodium hydroxide received by truck is used in the CIP process. CIP makeup is accomplished in one makeup tank and is returned to one waste CIP tank after solids are removed in the screener.

Under normal operating conditions, the plant will not have any wastewater discharges that have been in contact with the grain, grain mash, cleaning system, or contact process water. The plant will have blow down discharges from the cooling tower and boiler.

A distributed control system with graphical user interface and work stations will control the process. The control room console will have dual monitors to facilitate operator interface. Additional programmable logic controllers (PLCs) will control certain process equipment.

The cooking system requires the use of anhydrous ammonia, and other systems require the use of sulfuric acid. Therefore, storage will be on site to provide the quantities necessary. Local authorities may require programs to ensure safety and regulatory compliance.

Regulatory Requirements

Anticipated State and Federal Permits

Clean Air Act

- Prevention of Significant Deterioration (PSD) and Construction Permit
- Applicable Federal New Source Performance Standards (NSPS)
- Applicable National Emission Standards for Hazardous Air Pollutants (NESHAPS)
- Title V Operating Permit of the Clean Air Act Amendments of 1990
- Risk Management Plan

Clean Water Act

- National Pollutant Discharge Elimination System (NPDES)
- Oil Pollution Prevention and Spill Control Countermeasures

Comprehensive Environmental Response Compensation and Liability Act & Community Right to Know Act (CERCLA/EPCRA)

- Tier II Forms – listing of potentially hazardous chemicals stored on site

- EPCRA Section 313 and 304 and CERCLA Section 103. These reports track use and release of substances above threshold and/or designated quantities annually.

Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)

- Alcohol Fuel Permit (AFP)

State Permits

- Air Quality Permit
- Storage Tank Permits
- Water Quality Permits
- State Department of Revenue Fuel License
- State Department of Transportation
- Highway Access Permit
- Possible Easement Rights
- State Department of Health
- Boiler License
- State Department of Environmental Quality
- Water Permits
- Other waters and wetland considerations

Financial Analysis

When considering a new business venture it is common to calculate the financial return on investment, and when a new business (ethanol plant) is integral to an existing business (feedlot), it is necessary to consider the economic impact on the existing business. For the financial analysis, the economic return for a stand-alone ethanol plant is presented, and also the return for the combined operation of the ethanol plant and feedlot is presented. The combined return adds the ethanol plant income with the feedlot incremental income. Feedlot incremental income is the expected income with the ethanol plant minus the expected income without the ethanol plant.

For all financial calculations, the price of WDGS was set at 80% of the price of corn on a dry matter basis, consistent with most industry pricing trends in the U.S.

To calculate the feedlot incremental income it is necessary to determine how much of the cattle ration WDGS is once the ethanol plant comes on line. The amount of WDGS in the ration was balanced to the size of ethanol plant (about 11.5 million GPY ethanol producing about 90,000 tons WDGS per year) and the size of the feedlot. So, for example, a 30,000 head feedlot would have about 27% WDGS on a dry matter basis in the ration, assuming 85% annual average feedlot capacity. The equation in Figure 6 was then used to estimate the feed efficiency of the WDGS.

Table 5 – Base case and range for selected variables considered in the financial sensitivity analysis. For example, the base case was a 30,000 head feedlot, and the sensitivity analysis considered feedlots as small as 20,000 head and as large as 50,000 head.

		Range	
Sensitivity Analysis	**Base Case**	**Low**	**High**
Feedlot size	30,000	20,000	50,000
Project cost, millions of $	26	20	32
Fed cattle price, $/cwt	80.00	65.00	100.00
Feeder cattle price, $/cwt	95.00	80.00	130.00
Corn price, $/bu	4.00	2.00	6.00
Ethanol price, $/gal	2.00	1.00	4.00

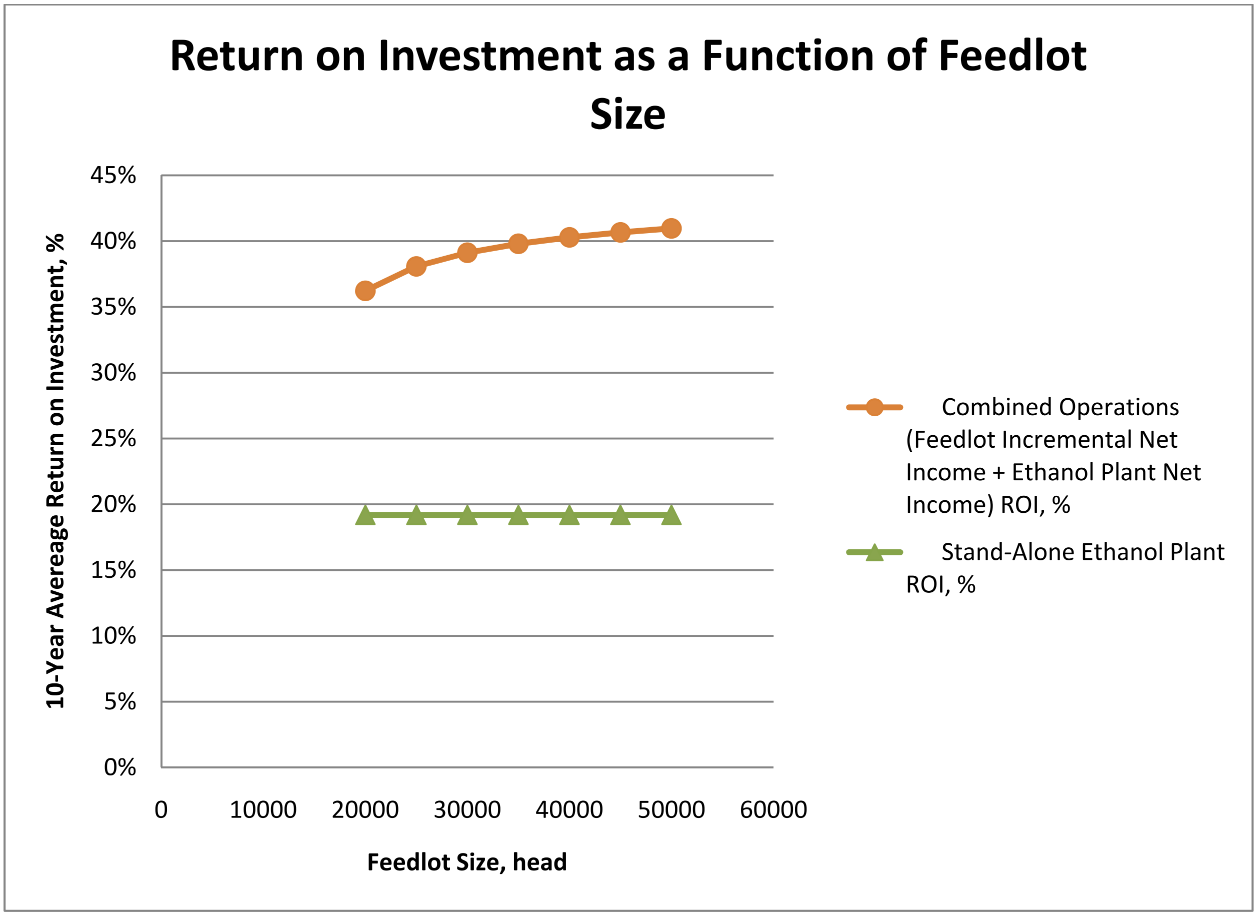
For the base case, the calculated 10-year average ROI was 19.2% for the stand-alone ethanol plant, and 39.1% for the combined operation (feedlot incremental income plus ethanol plant net income). These returns are based on 50% equity investment and a 10-year loan at 6% interest. See Appendix A for the base case financial statements.

The sensitivity analysis considers six variables: Feedlot size, project cost, fed cattle price, feeder cattle price, corn price, and ethanol price. For the sensitivity analysis, each variable was changed independently. In reality, the prices of corn, cattle, and ethanol are inter-dependent; however the correlation is often variable, so it's impossible to predict cattle or ethanol prices as a function of corn prices.

Feedlot Size

The feedlot size affects ROI for the combined operation, and larger feedlots enjoy better ROI. The size of the feedlot has no effect on the stand-alone ethanol plant's ROI. Figure 10 shows the sensitivity of ROI to feedlot size.

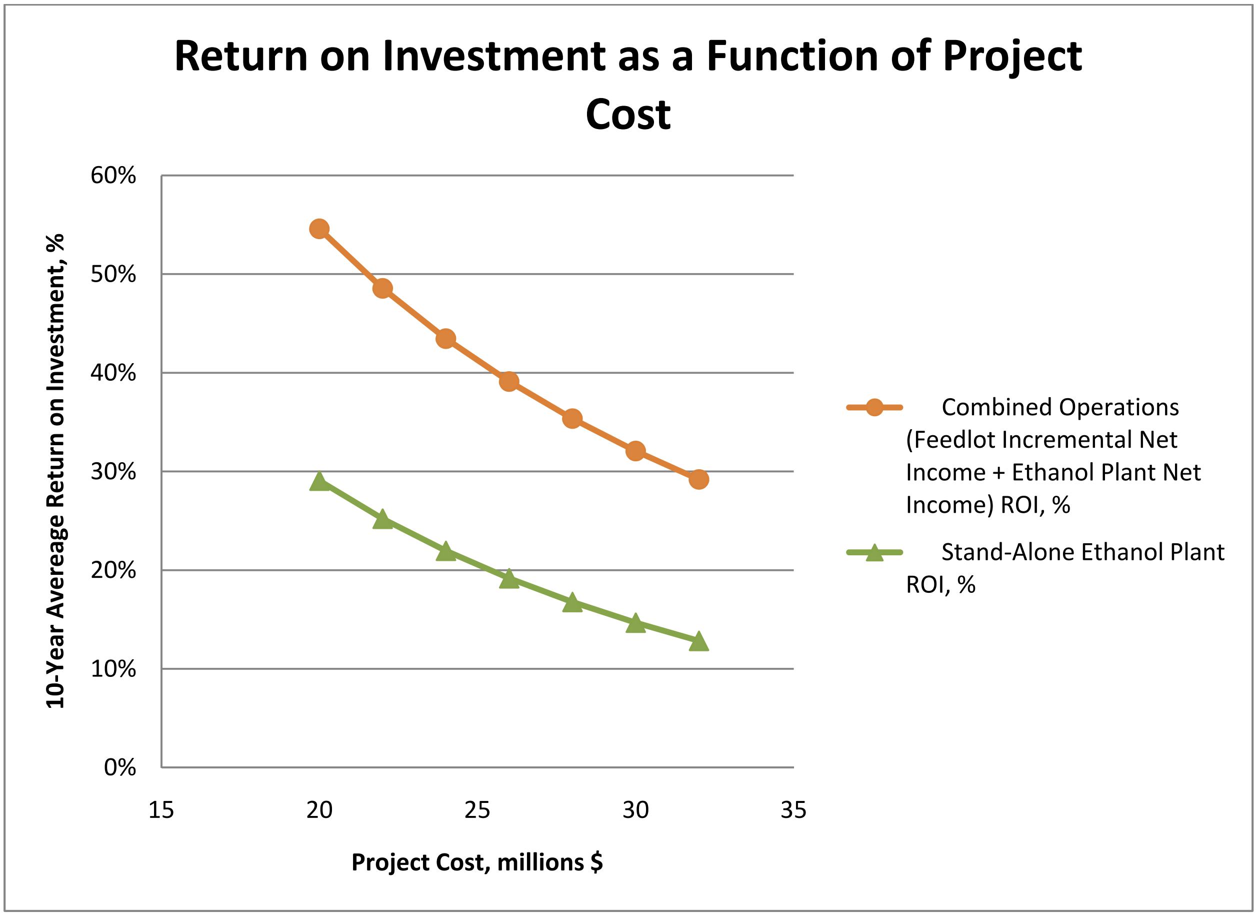
Figure 10 – Sensitivity of ROI to feedlot size. Larger feedlots enjoy higher ROI because the feed efficiency of WDGS is greater at low concentrations in the ration (see Figure 6). Smaller feedlots can achieve this advantage by joining together with other feeders and share the ethanol plant's WDGS output.



Project Cost

Project cost is a primary focus for project designers and developers because it is the variable they have the most control over. Many ethanol projects are measured by project costs per gallon. Over the last decade, ethanol plants have become more automated and efficient, the price of construction materials like concrete and steel have increased, so the cost per gallon has also increased. Currently, an 11.5 million GPY ethanol plant is expected to cost about $20 million to $32 million for the complete engineering, procurement, and construction (EPC) contract. In addition, several million additional dollars are typically required for land, roadways, utilities, and various other items. The base case considers a $26 million EPC contract plus $2.8 million for land, buildings, site development, spare parts, and working capital for a total project cost of $28.8 million.

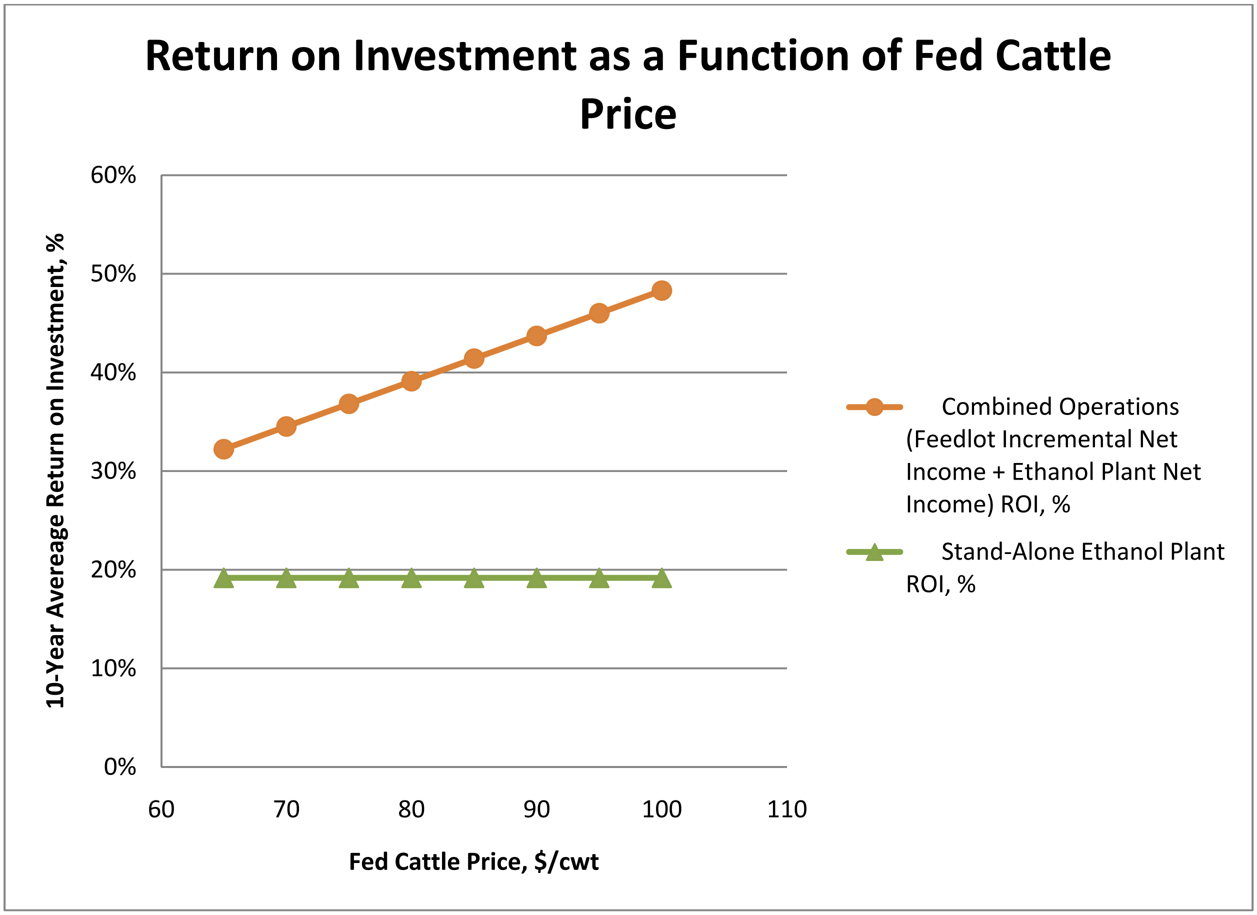
Figure 11 – Sensitivity of ROI to EPC project cost. An additional $2.8 million is added to EPC cost to cover additional project requirements.



Fed Cattle Price

Fed cattle prices are obviously a critical component of feedlot profitability. Figure 12 shows the impact of fed cattle prices on ROI. Note that even when fed cattle prices are low, the combined operation (feedlot incremental net income plus ethanol plant net income) still provides greater than 30% ROI.

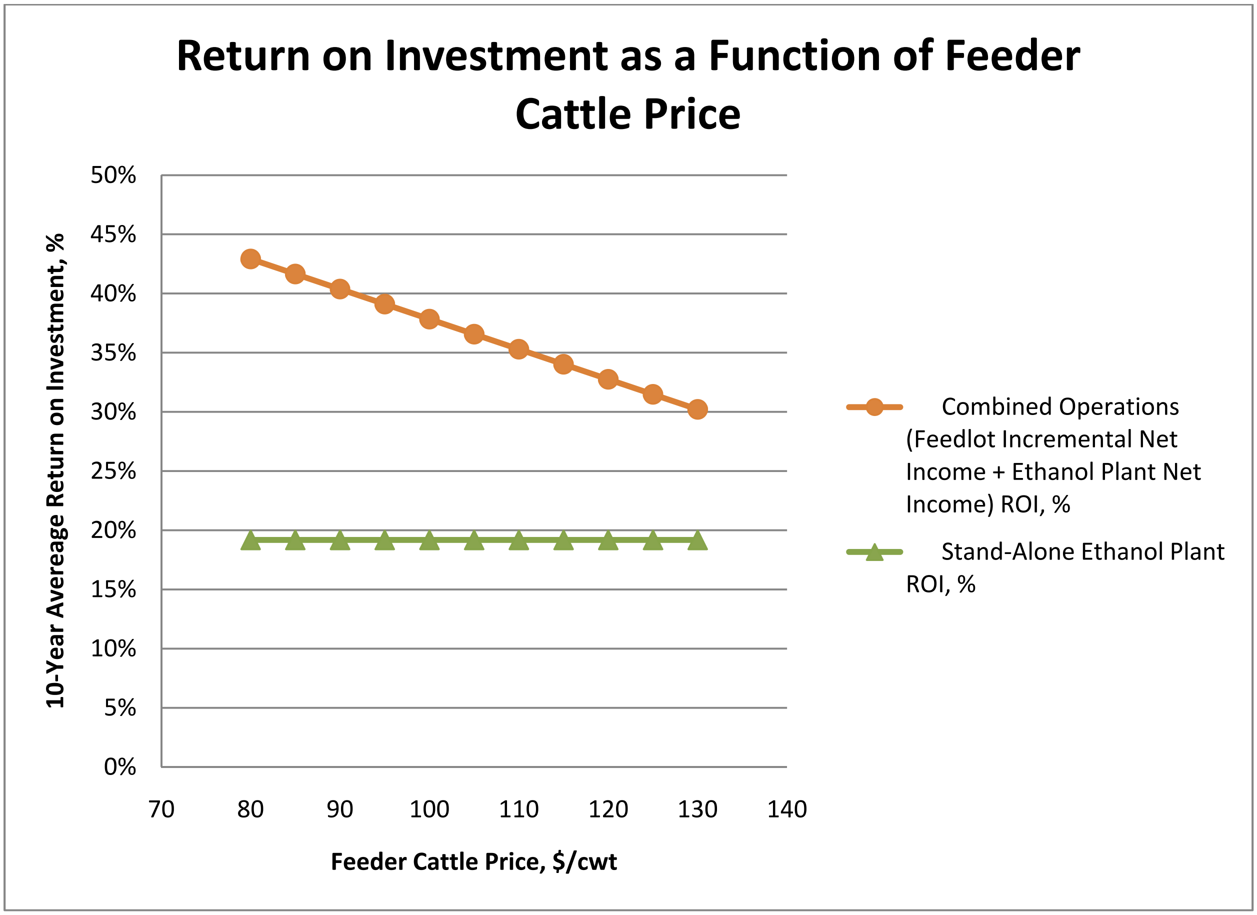
Figure 12 – Sensitivity of ROI to fed cattle price.



Feeder Cattle Price

Feeder cattle price is another critical element of feedlot profitability. Figure 13 shows the impact of feeder cattle prices on ROI. Note that even when feeder cattle prices are high, the combined operation ROI is greater than 30%.

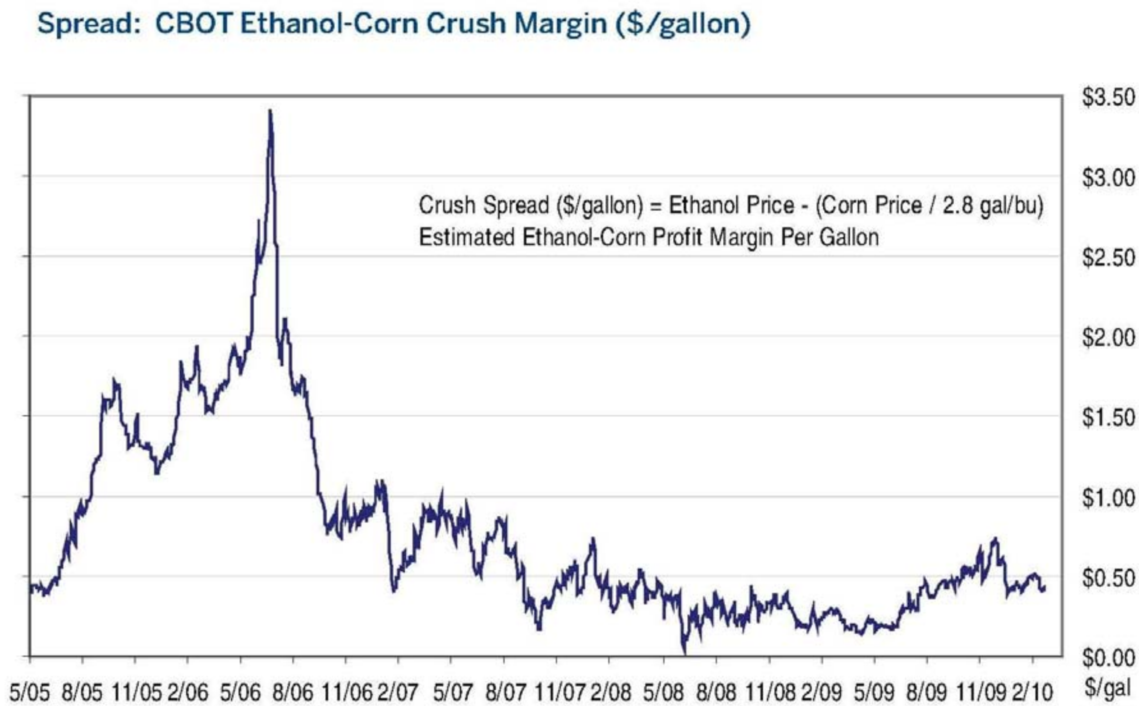
Figure 13 – Sensitivity of ROI to feeder cattle price.



Grain Price

Grain price is probably the single most important variable affecting profitability at feedlots and ethanol plants. Grain costs are typically 70 – 80% of the variable costs of running an ethanol plant. A gross measure of ethanol plant profitability is the "crush margin" which is calculated by subtracting the price of a bushel of grain divided by 2.8 from the price of a gallon of ethanol. As can be seen in Figure 14, the "crush margin" for corn ethanol using Chicago Board of Trade prices has been positive for the past 5 years. In mid-February 2010, the "crush margin" was $0.419 per gallon, below the recent 2-year high of $0.736 per gallon.

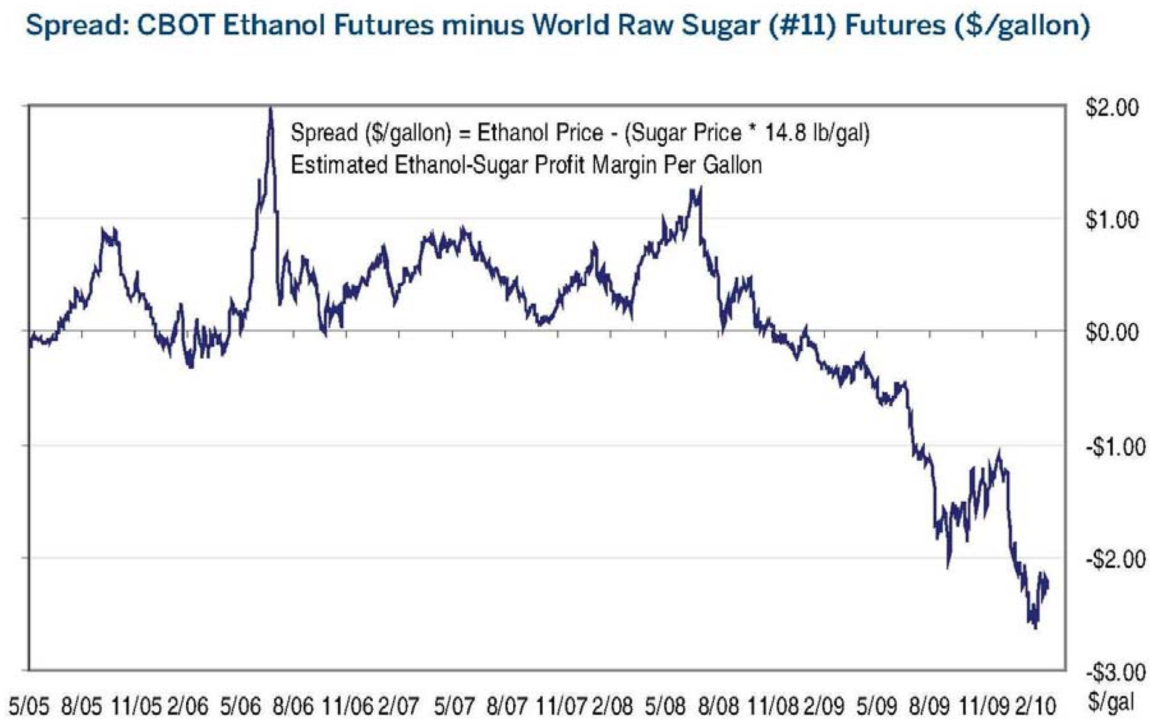
Figure 14 – Corn ethanol "crush margin" using Chicago Board of Trade prices. Note the spike in the summer of 2006 was an anomaly caused by high demand for ethanol as an oxygenate in gasoline after MTBE was banned; today there is sufficient ethanol production to meet oxygenate requirements.



Source: CME Group, "Ethanol Outlook Report," published Feb. 22, 2010.

For comparison purposes, the "crush margin for sugar-cane ethanol is presented in Figure 15. One gallon of ethanol requires 14.8 pounds of sugar. In the U.S., grain-ethanol producers create distillers grains as a co-product; in Brazil, sugar cane-ethanol producers create electricity as a co-product. The electricity is generated by burning the fiber residue remaining after the sugarcane stalks are crushed to extract their juice. The "crush margin" charts for corn and sugarcane do not include the value of the co-products, and they also do not include costs of operations such as labor, chemicals, etc.

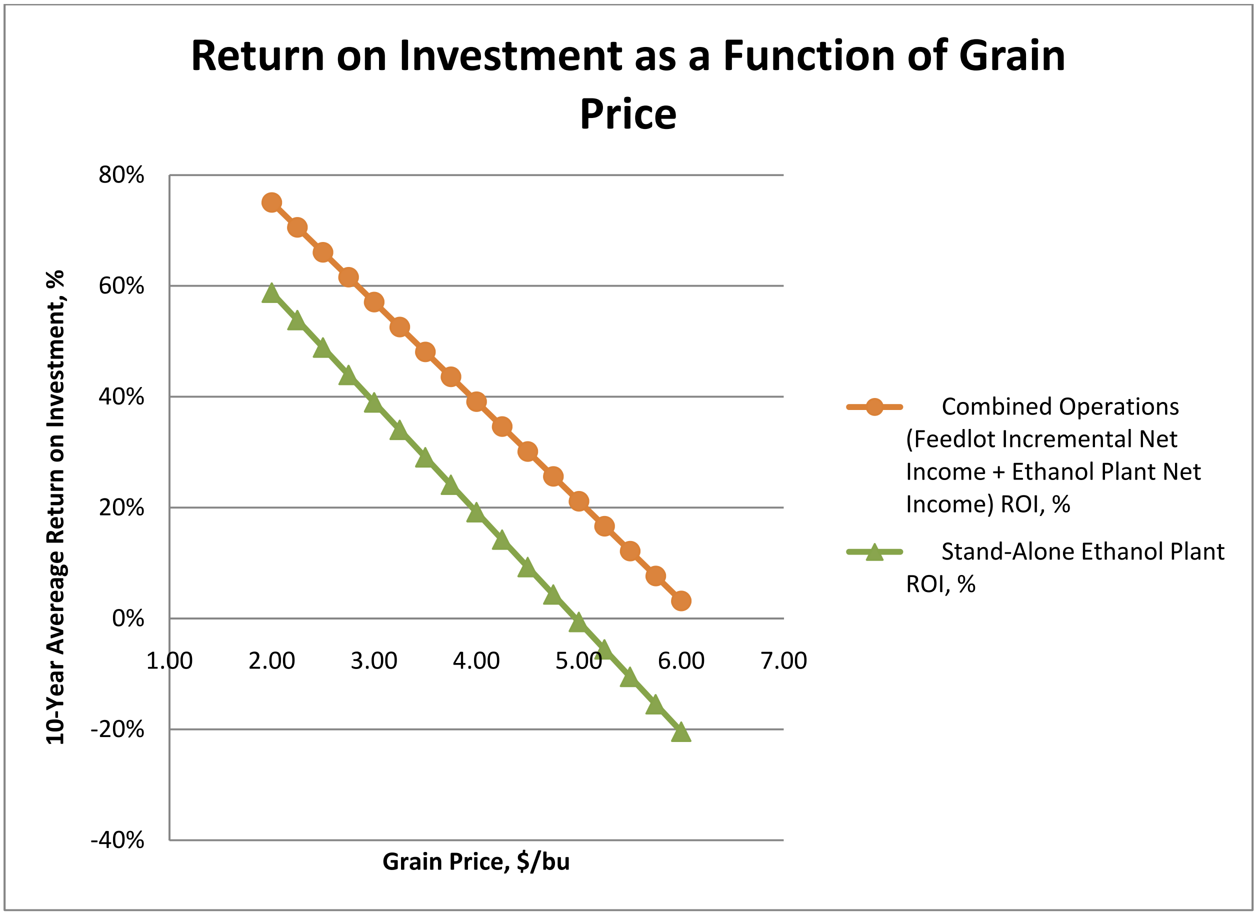
Figure 15 – Sugar cane ethanol "crush margin." Margins have been negative for more than one year. Floods in Brazil combined with high demand for sugar in India and China have caused the price of sugar to increase, affecting sugarcane based ethanol profitability. Further compounding problems for the Brazilian ethanol producers are new environmental regulations that place restrictions on how sugarcane can be grown and how the ethanol plants can operate.



Source: CME Group, "Ethanol Outlook Report," published Feb. 22, 2010.

For a feedlot ethanol plant, profitability is highly sensitive to grain prices as shown in Figure 16.

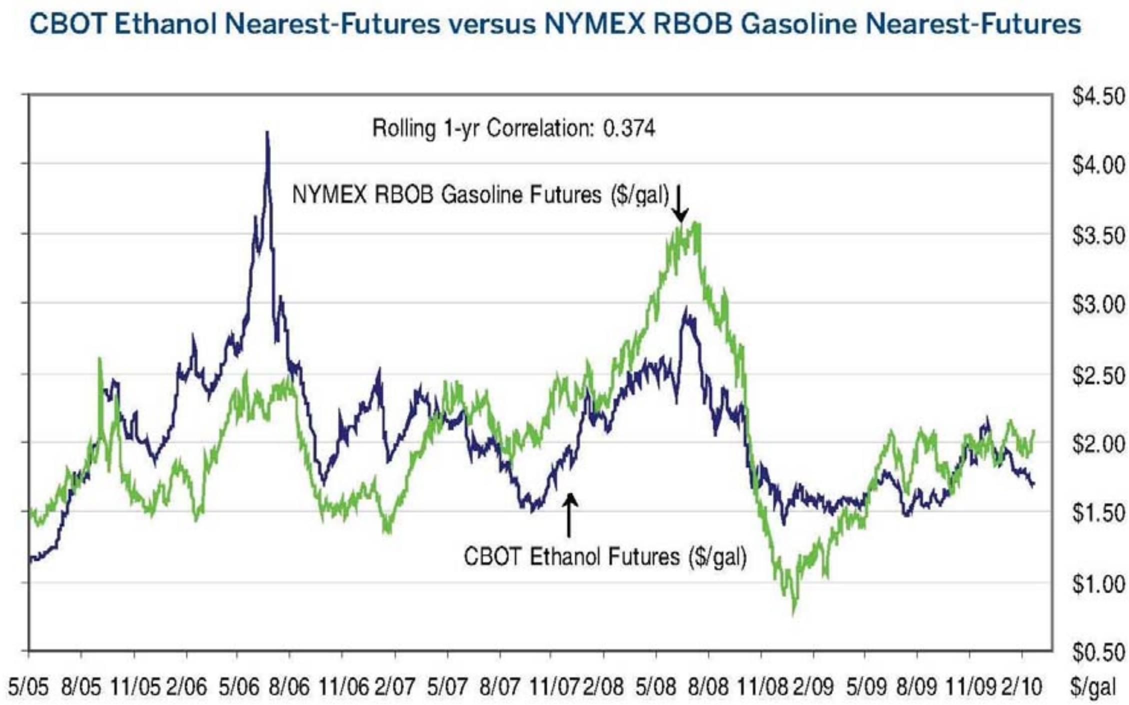
Figure 16 – Sensitivity of ROI to grain price. With grain priced at $2.00 a bushel, ROI for the combined operation is greater than 75%; with $6 a bushel grain, ROI for the combined operation falls to 3.2%.



Ethanol Price

Since most ethanol produced in the U.S. is blended into motor fuel, ethanol prices generally track crude oil and gasoline prices as shown in Figure 17.

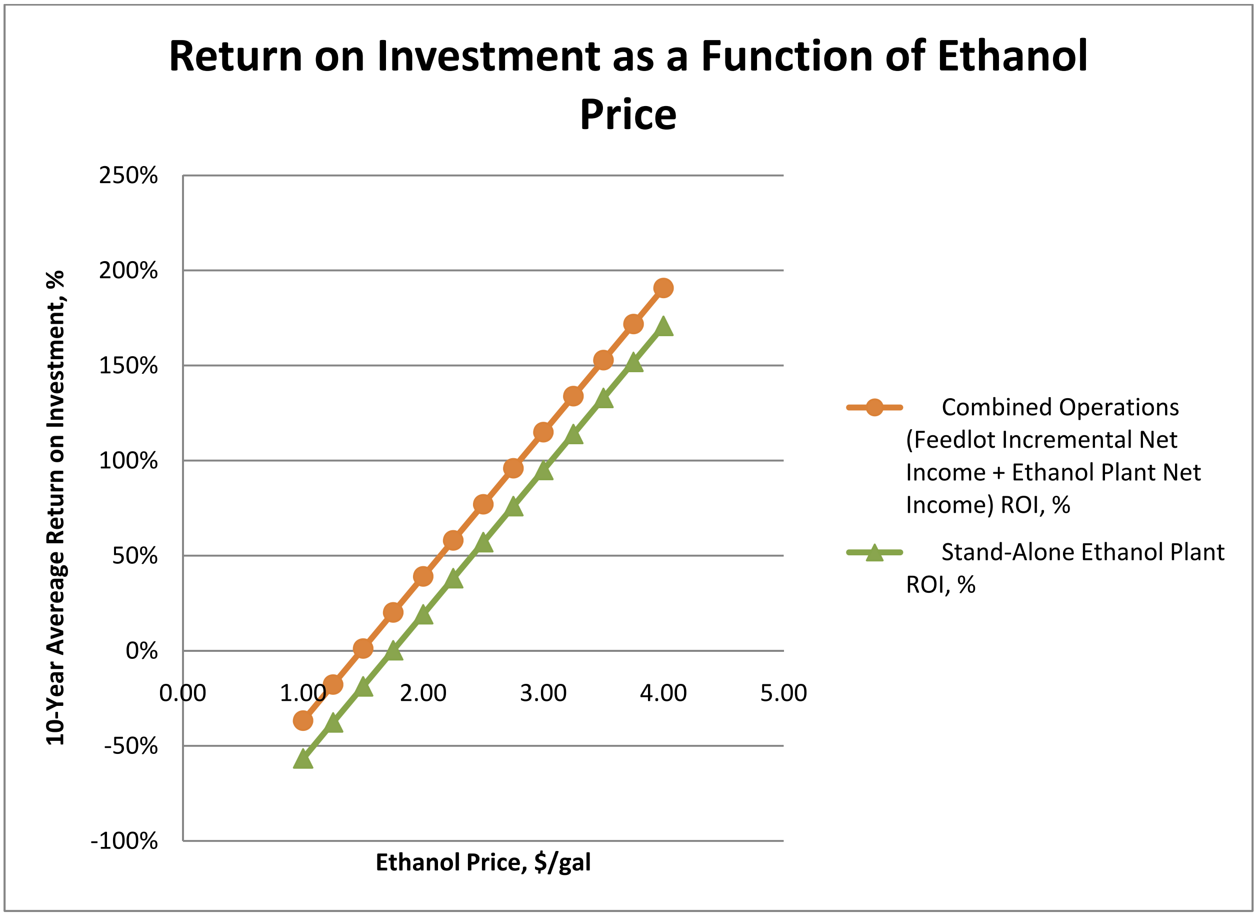
Figure 17 – Ethanol and gasoline price trends. RBOB is regular gasoline blendstock for oxygenate blending, a wholesale non-oxygenated blendstock traded in the New York Harbor barge market that is ready for the addition of 10% ethanol at the truck rack. NYMEX RBOB prices are widely reported in commodity market publications and generally represent the wholesale pre-tax price of unleaded gasoline in the U.S.



Source: CME Group, "Ethanol Outlook Report," published Feb. 22, 2010.

The ROI for a feedlot ethanol plant is highly sensitive to ethanol price as shown in Figure 18.

Figure 18 – Sensitivity of ROI to ethanol price. Using the base case grain price of $4.00 per bushel, if ethanol was priced at $1.00 per gallon, the ROI for the combined operation would be -36.7%; with ethanol priced at $4.00 per gallon, the combined operation ROI would be 191%. Typically, the cost of grain, ethanol and gasoline are somewhat correlated so the extremes in ROI are unlikely. However, the examples point to the sensitivity of ethanol price to ROI.



Payroll

A typical 10 million GPY feedlot ethanol plant may employ 17 people on a full time basis. Ethanol Producer Magazine released the results of an industry wide salary survey in January 2010. Total salary and benefits are expected to be about $1.295 million per year.

Table 6 – Anticipated headcount and salary expenses for a typical 10 million GPY ethanol plant.

Occupation	**Salary**	**Number**	**Total Salary**	**Benefits**	**Total**
General Manager / Controller	$125,000	1	$125,000	$50,000	$175,000
Plant Manager	$80,000	1	$80,000	$32,000	$112,000
Lab Manager	$55,000	1	$55,000	$22,000	$77,000
Maintenance Manager	$70,000	1	$70,000	$28,000	$98,000
Maintenance Tech	$40,000	2	$80,000	$32,000	$112,000
Operator - Days	$45,000	4	$180,000	$72,000	$252,000
Operator - Nights	$50,000	6	$300,000	$120,000	$420,000
Clerk	$35,000	1	$35,000	$14,000	$49,000
Total Personnel Costs		17	$925,000	$370,000	$1,295,000

Source: Ethanol Producer Magazine, January 2010, "2010 US Ethanol Industry Salary Survey".

Depreciation and amortization

The depreciation schedule is included with the financial statements in Appendix A. The total project cost of $28.8 million is depreciated using a combination of depreciation methods as shown in the table. The anticipated project life is 20 years, although there is evidence the plant will last up to 50 years with proper maintenance since most major equipment in corrosive service is stainless steel. A plant truck, forklift and front-end loader are assumed to have a useful life of 10 years.

The total $28.8 million investment is assumed to be financed with 50% equity and 50% debt. The $14.4 million loan is paid off over a period of 10 years at the interest rate of 6%. An additional short-term loan of $2 million for working capital is financed at 4.5%.

Appendix A – Financial Statements

Feedlot-Ethanol Plant Feasibility Study

Feedlot Economics

		with Ethanol Plant	without Ethanol Plant
Feedlot Heat Count		30,000	30,000
Fed Steer Price, Live Weight, $/cwt		$ 80.00	$ 80.00
Feeder Steer Price, $/cwt (700-800 lb)		$ 95.00	$ 95.00
Avg Feeder Weight, lbs		750	750
Avg Final Weight, lbs		1,350	1,350
Avg Daily Gain, lb/day		3.86	3.47
Feed:Gain Ratio, lb/lb		5.82	6.44
Feed (DM), lb/day		22.42	22.32
Days on Feed		156	173
Death Loss, %		1.5%	1.5%
Health/Medicine, $/head		$ 15.00	$ 15.00
Yardage, $/head/day		$ 0.35	$ 0.35
Interest		6%	6%
Feed		Ration, % DM	Ration, % DM
Corn	($ 4 /Bu)	62%	89%
WDGS	($ 49.23 /ton as is @ 36.6 % DM) *	27%	0%
Alfalfa	($ 110 / ton)	7%	7%
Supplement	($ 280 / ton)	4%	4%
Total Feeding Cost, $/head		$ 289.12	$ 337.80
Feeding Cost of Gain, $/cwt		$ 48.19	$ 56.30
Cost of inputs, per head		$ 1,089.31	$ 1,146.14
Value of outputs, per head		$ 1,080.00	$ 1,080.00
Profit/Loss, $/head (includes 1.5% death loss)		$ (9.17)	$ (66.14)
Annual cattle fed (avg 85% feedlot capacity)		59,816	53,780
Feedlot Profit / Loss, Annual --------->		$ (548,356)	$ (3,557,286)
Annual Feedlot Benefit For Adding Ethanol Plant:		**$ 3,008,931**	

Ethanol Plant Economics

Grind rate, bu/hr	480
Corn, $/bu	$ 4.00
EtOH, $/gal	$ 2.00
Nat Gas, $/MMBtu	$ 5.28
Electricity, $/kWh	$ 0.07
Labor & benefits, $/yr	$ 1,295,000
Chemicals, Enzyme, Yeast, $/gal	$ 0.10
Operating days/yr	355
On stream	100%
WDGS wet yield, #/bu	43.7
WDGS wet rate, #/day	503,424
WDGS DM yield, #/bu	16
WDGS DM rate, #/day	184,320
EtOH Prod, MMGPY	11,450,880
Corn Used, bu/yr	4,089,600
Cost of inputs, annual	
Grain	$ 16,358,400
Denaturant	$ 1,179,441
Chemicals, Enzymes, Yeast	$ 1,145,088
Natural Gas	$ 1,208,755
Electricity	$ 480,937
Labor	$ 1,295,000
Maintenance	$ 171,763
Insurance & Property Tax	$ 115,000
Total cost of inputs	$ 21,954,384
Value of outputs, annual	
Ethanol	$ 22,901,760
WDGS *	$ 4,398,897
Total value of outputs	$ 27,300,657
Ethanol Plant Gross Profit, Annual	**$ 5,346,274**

Combined Benefit (Feedlot Benefit + Ethanol Plant Profit) = $8,355,204

* WDGS price set at 80% of the price of corn on a dry matter basis.

Combined Operation Profit (Feedlot Profit + Ethanol Plant Profit) = $4,797,918

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2/23/2010

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Pro Forma Income Statement

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Annual Sales Volumes											
Ethanol	gallons	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880
WDGS	tons	89,358	89,358	89,358	89,358	89,358	89,358	89,358	89,358	89,358	89,358
Ethanol											
Total Volume, gallons		11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880	11,450,880
Price/Gallon		$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00
Gross Ethanol Sales		$22,901,760	$22,901,760	$22,901,760	$22,901,760	$22,901,760	$22,901,760	$22,901,760	$22,901,760	$22,901,760	$22,901,760
WDGS											
Total Volume, tons		89,358	89,358	89,358	89,358	89,358	89,358	89,358	89,358	89,358	89,358
Price/Ton		$49.228	$49.228	$49.228	$49.228	$49.228	$49.228	$49.228	$49.228	$49.228	$49.228
Gross WDGS Sales		$4,398,897	$4,398,897	$4,398,897	$4,398,897	$4,398,897	$4,398,897	$4,398,897	$4,398,897	$4,398,897	$4,398,897
Total Ethanol Plant Sales		$27,300,657	$27,300,657	$27,300,657	$27,300,657	$27,300,657	$27,300,657	$27,300,657	$27,300,657	$27,300,657	$27,300,657
Variable Costs											
Grain		$16,358,400	$16,358,400	$16,358,400	$16,358,400	$16,358,400	$16,358,400	$16,358,400	$16,358,400	$16,358,400	$16,358,400
Denaturant		$1,179,441	$1,179,441	$1,179,441	$1,179,441	$1,179,441	$1,179,441	$1,179,441	$1,179,441	$1,179,441	$1,179,441
Chemicals, Enzymes, Yeast		$1,145,088	$1,145,088	$1,145,088	$1,145,088	$1,145,088	$1,145,088	$1,145,088	$1,145,088	$1,145,088	$1,145,088
Natural Gas		$1,208,755	$1,208,755	$1,208,755	$1,208,755	$1,208,755	$1,208,755	$1,208,755	$1,208,755	$1,208,755	$1,208,755
Electricity		$480,937	$480,937	$480,937	$480,937	$480,937	$480,937	$480,937	$480,937	$480,937	$480,937
Total Variable Costs		$20,372,620	$20,372,620	$20,372,620	$20,372,620	$20,372,620	$20,372,620	$20,372,620	$20,372,620	$20,372,620	$20,372,620
Fixed Costs											
Labor & Benefits		$1,295,000	$1,295,000	$1,295,000	$1,295,000	$1,295,000	$1,295,000	$1,295,000	$1,295,000	$1,295,000	$1,295,000
Maintenance		$171,763	$171,763	$171,763	$171,763	$171,763	$171,763	$171,763	$171,763	$171,763	$171,763
Insurance & Property Tax		$115,000	$115,000	$115,000	$115,000	$115,000	$115,000	$115,000	$115,000	$115,000	$115,000
Total Fixed Costs		$1,581,763	$1,581,763	$1,581,763	$1,581,763	$1,581,763	$1,581,763	$1,581,763	$1,581,763	$1,581,763	$1,581,763
Total Variable & Fixed Costs		$21,954,384	$21,954,384	$21,954,384	$21,954,384	$21,954,384	$21,954,384	$21,954,384	$21,954,384	$21,954,384	$21,954,384
EBIDT		$5,346,274	$5,346,274	$5,346,274	$5,346,274	$5,346,274	$5,346,274	$5,346,274	$5,346,274	$5,346,274	$5,346,274
Less:											
Interest		$954,000	$888,450	$818,967	$745,315	$667,244	$584,489	$496,768	$403,785	$305,222	$200,745
Depreciation		$2,379,995	$2,260,739	$2,141,484	$2,022,228	$1,902,973	$1,783,718	$1,664,462	$1,545,207	$1,425,951	$1,306,696
Pre-Tax Income		$2,012,279	$2,197,085	$2,385,823	$2,578,730	$2,776,057	$2,978,067	$3,185,043	$3,397,282	$3,615,101	$3,838,833
Income Tax (4.63%)		$93,169	$101,725	$110,464	$119,395	$128,531	$137,885	$147,468	$157,294	$167,379	$177,738
Net Earnings		$1,919,111	$2,095,360	$2,275,359	$2,459,335	$2,647,526	$2,840,183	$3,037,576	$3,239,988	$3,447,722	$3,661,095
Stand-Alone Ethanol Plant											
Return on Investment		13.3%	14.6%	15.8%	17.1%	18.4%	19.7%	21.1%	22.5%	23.9%	25.4%
Average ROI		19.2%									
Feedlot Pre-Tax Incremental Income		$3,008,931	$3,008,931	$3,008,931	$3,008,931	$3,008,931	$3,008,931	$3,008,931	$3,008,931	$3,008,931	$3,008,931
Income Tax (4.63%)		$139,313	$139,313	$139,313	$139,313	$139,313	$139,313	$139,313	$139,313	$139,313	$139,313
Feedlot Net Incremental Income		$2,869,617	$2,869,617	$2,869,617	$2,869,617	$2,869,617	$2,869,617	$2,869,617	$2,869,617	$2,869,617	$2,869,617
Combined Feedlot & Ethanol Plant											
Net Earnings		$4,788,728	$4,964,977	$5,144,976	$5,328,952	$5,517,142	$5,709,800	$5,907,193	$6,109,605	$6,317,339	$6,530,712
Return on Investment		33.3%	34.9%	35.7%	37.0%	38.3%	39.7%	41.0%	42.4%	43.9%	45.4%
Average ROI		39.1%									

2/24/2010

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Depreciation Schedule

Plant and Equipment Cost		
EPC Contract	$26,000,000	
Total Plant and Equipment Cost	**$26,000,000**	
Owner's Capital Costs		
Administration Building & Office Equment	$250,000	
Site Development	$500,000	
Truck, Forklift, Front-End Loader	$100,000	
Orginizational Costs	$250,000	
Spare Parts	$150,000	
Startup Costs	$150,000	
Land	$100,000	(10 Acres @ $10,000 per acre)
Working Capital	$1,300,000	(5% of EPC contract)
Total Owner's Capital Costs	**$2,800,000**	
Total Capital Cost	**$28,800,000**	

Depreciation Inputs	Years	Salvage Value	Method
EPC Provided Equipment	20	$1,300,000	Sum-of-years-digits
Administration Building & Office Equment	20	$25,000	Straight-line
Truck, Forklift, Front-End Loader	10	$10,000	Sum-of-years-digits

Depreciation Table	1	2	3	4	5	6	7	8	9	10
EPC Provided Equipment	$2,352,381	$2,234,762	$2,117,143	$1,999,524	$1,881,905	$1,764,286	$1,646,667	$1,529,048	$1,411,429	$1,293,810
Administration Building & Office Equment	$11,250	$11,250	$11,250	$11,250	$11,250	$11,250	$11,250	$11,250	$11,250	$11,250
Truck, Forklift, Front-End Loader	$16,364	$14,727	$13,091	$11,455	$9,818	$8,182	$6,545	$4,909	$3,273	$1,636
Total Depreciation	**$2,379,995**	**$2,260,739**	**$2,141,484**	**$2,022,228**	**$1,902,973**	**$1,783,718**	**$1,664,462**	**$1,545,207**	**$1,425,951**	**$1,306,696**

EPC Provided Equipment										
Year	1	2	3	4	5	6	7	8	9	10
SOYD	210									
SOYD Depreciation Rate	0.095238095	0.09047619	0.085714286	0.080952381	0.076190476	0.071428571	0.066666667	0.061904762	0.057142857	0.052380952
Book Value - Beginning of Year	$26,000,000	$23,647,619	$21,412,857	$19,295,714	$17,296,190	$15,414,286	$13,650,000	$12,003,333	$10,474,286	$9,062,857
Total Depreciable Cost	$24,700,000	$24,700,000	$24,700,000	$24,700,000	$24,700,000	$24,700,000	$24,700,000	$24,700,000	$24,700,000	$24,700,000
Depreciation Expense	$2,352,381	$2,234,762	$2,117,143	$1,999,524	$1,881,905	$1,764,286	$1,646,667	$1,529,048	$1,411,429	$1,293,810
Accumulated Depreciation	$2,352,381	$4,587,143	$6,704,286	$8,703,810	$10,585,714	$12,350,000	$13,996,667	$15,525,714	$16,937,143	$18,230,952
Book Value - End of Year	$23,647,619	$21,412,857	$19,295,714	$17,296,190	$15,414,286	$13,650,000	$12,003,333	$10,474,286	$9,062,857	$7,769,048

Truck, Forklift, Front-End Loader										
Year	1	2	3	4	5	6	7	8	9	10
SOYD	55									
SOYD Depreciation Rate	0.181818182	0.163636364	0.145454545	0.127272727	0.109090909	0.090909091	0.072727273	0.054545455	0.036363636	0.018181818
Book Value - Beginning of Year	$100,000	$83,636	$68,909	$55,818	$44,364	$34,545	$26,364	$19,818	$14,909	$11,636
Total Depreciable Cost	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000
Depreciation Expense	$16,364	$14,727	$13,091	$11,455	$9,818	$8,182	$6,545	$4,909	$3,273	$1,636
Accumulated Depreciation	$16,364	$31,091	$44,182	$55,636	$65,455	$73,636	$80,182	$85,091	$88,364	$90,000
Book Value - End of Year	$83,636	$68,909	$55,818	$44,364	$34,545	$26,364	$19,818	$14,909	$11,636	$10,000

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Amortization Schedule

Total Investment	$28,800,000
Long Term Interest Rate	6%
Percent Financed	50%
Loan Amount	$14,400,000
Loan Term	10

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Balance	$14,400,000	$13,307,501	$12,149,453	$10,921,921	$9,620,738	$8,241,484	$6,779,474	$5,229,744	$3,587,030	$1,845,753
Interest Rate	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
Interest	$864,000	$798,450	$728,967	$655,315	$577,244	$494,489	$406,768	$313,785	$215,222	$110,745
Annual Payment	$1,956,499	$1,956,499	$1,956,499	$1,956,499	$1,956,499	$1,956,499	$1,956,499	$1,956,499	$1,956,499	$1,956,499
Principal	$1,092,499	$1,158,049	$1,227,531	$1,301,183	$1,379,254	$1,462,010	$1,549,730	$1,642,714	$1,741,277	$1,845,753
Ending Balance	$13,307,501	$12,149,453	$10,921,921	$9,620,738	$8,241,484	$6,779,474	$5,229,744	$3,587,030	$1,845,753	$0
Working Capital	$2,000,000									
Short Term Interest Rate	4.50%									
Interest Amount	$90,000									
Total Interest Expense	$954,000	$888,450	$818,967	$745,315	$667,244	$584,489	$496,768	$403,785	$305,222	$200,745

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