

Feed Procurement Strategies in an Ethanol Fueled Market  
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To fully appreciate the discussion, these notes accompany Dr. Buhr's Pork Congress Power Point Presentation. Please utilize this information when viewing his Pork Congress seminar contribution.

**Slide 1: Title Slide *Feed Procurement Strategies in an Ethanol Fueled Market.***

**Slide 2:**

Rates of growth are expected to continue. However, recent decreases in energy prices, rising concerns regarding ethanol's impact on fuel costs, increasing development of other biofuels, and rising capital costs due to increasing steel, concrete and other material prices all point to some moderation of the trend. The key wildcard is policy with a new democratic congress and the new farm bill – could add fuel to the fire or moderate its effect. Still, the plants that are there are likely to operate, some are coming online and it is likely that overall corn prices will rise and become more variable.

**Slide 3:**

Current discussion seems to indicate the plants planned may become less economically appealing and may not enter production. Plants under construction are likely to enter though and we still see increases in corn demand. The economies of scale for ethanol suggest that they either run at full capacity or don't run at all – so it's very unlikely existing plants will run at anything less than capacity meaning they will get their corn. I suggest reading the Iowa State University CARD study. Its approach to corn price effects was to consider how much ethanol plants could pay for corn at different oil price levels. The \$5.43/bushel number was the break-even price with \$80/bbl oil prices. The report's available at <http://www.card.iastate.edu>.

**Slide 4:**

There seems to be a conflict and we saw this coming. Changes in the dynamics of the hog industry itself leads to some of the current tension. Twenty years ago when ethanol was in development, corn growers were hog producers. If corn prices went up, hog production went down but the total revenues went to the same people (except that the reason for high corn prices back then wasn't demand but lack of supply). Now, with specialized hog production and many contractors insulated from corn prices the costs of higher corn prices are borne more directly by the hog production firms and they don't have the option of selling corn vs. hogs.

**Slide 5:**

There is a lot of uncertainty regarding the ethanol market and it is heavily dependent on farm policy and oil prices. Multiple sources provide a broad range of scenarios on the quantity and price impacts of ethanol.

**Slide 6:**

Increased demand for corn generally results in higher prices. Soybean meal is a bit harder to determine depending on acreage reductions due to increased corn acreage and the demand for soybean oil for biodiesel. In all likelihood, we will have a protein surplus from DDGS and meal prices and an dietary energy deficit. All of these models account for some of these dynamics but are heavily dependent on issues such as CRP release, yields on marginal acreage coming into production, etc.

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**Slide 7:**

Although much of this is attributed to ethanol, that may not be accurate. World grain stocks (coarse and small) have been low and so some of this is simply supply driven as usual. Therefore, this could be the equivalent of our warm January that makes everyone think about global warming, but in fact could be just a blip. Of course if we knew which it was we could respond with appropriate procurement plans. The following discussion is based on this premise. It's very hard to predict what's going to happen in corn markets with huge uncertainty. Therefore, strategies begin with the least aggressive and most likely to provide stability to more aggressive approaches which require greater management.

**Slide 8:** No Notes

**Slide 9:**

First, we need to gain an objective perspective on the impact of corn price on feed costs in hogs. I haven't found anyone specifically address this issue and most conversations begin and end with \$4.00 corn prices. However, corn only accounts for 35% of hog costs, so a doubling of corn prices from \$2.00 to \$4.00 doesn't double the costs of production. 35% isn't good but it's not as daunting as 100%.

**Slide 10:**

This shows the impacts of price scenarios on hog costs of feed and production. The key point is that corn prices represent only 35% of feed costs from wean to finish. So, for example even in the worst case of corn prices doubling (100% increase) total costs only increase by about 35%. Further, given protein (i.e., soymeal) interactions, there may be some mitigation there as well. Based on corn price estimates this means that most likely ethanol will cause feed costs to rise only 15.5% for hogs. Note the bottom line shows the savings from DDGS – I've checked these with Jerry Shurson who indicated they are consistent with preliminary estimates. The key question is what happens to DDGS prices going forward? Do they decrease in price with a mountain of DDGS from expanding ethanol production, in which case hog producers can benefit? Or more likely, the ethanol industry finds uses (burning, etc.) and the mountain doesn't emerge and DDGS prices continue to follow corn prices.

As a final note, I've pushed the estimates on feed gain to 2.7. In discussions with solid commercial operations they all agreed that if not at this level, they would begin to press their contract growers. Obviously with high corn prices, feed/gain becomes the critical performance factor. If you're not near this level (a lot of economists with 3.0 for assumptions) you will find it very difficult to compete in this new higher feed cost environment.

**Slide 11:**

I have a model which analyzes this market dynamic that I created on behalf of the National Pork Board. It includes the pork, beef and broiler sectors as well as meat demand and trade. To analyze the net effect on swine I calculated similar diets for beef and poultry under the same set of price assumptions. In these results, broiler feed costs are most likely to increase 27% while beef's only increase by 9 percent. This is an important dynamic because chicken becomes relatively more expensive and pork gains some share from them. Beef is the clear winner – because they'll eat anything! For brevity, the next slide shows only the impact on hog prices of necessary for this presentation. If you would like complete results, contact me.

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**Slide 12:**

Showing only the key impact on hog prices, hog prices increase by an average of about 9.3%. It's interesting to note at the far left side of the graph that there is a small probability they could actually decrease. This occurs with a combination of low end corn prices and very low meal prices – a possible, but not probable outcome. Similarly, hog prices could increase as much as 21% which would happen with the highest corn price and highest meal prices.

Although not shown, beef and broiler farm prices also increase as do all retail prices. Quantities of beef, pork and chicken decline. In total, beef producers lose 1.1 billion dollars per year, pork producers lose 0.9 billion dollars per year and chicken producers lose 1.1 billion per year. Ultimately consumers are the big losers, paying roughly 6.2 billion dollars more for meat products alone. If you are interested in complete results you may request them from [bbuhr@umn.edu](mailto:bbuhr@umn.edu)

**Slide 13:**

Comparing the changes in feed costs and hog prices, hog producers are better off! How can this be? If I presented the full simulation results it would show that broilers are harmed the most by the feed price increases (you can see this in the feed cost impacts earlier). Pork and beef both pick up market share from broilers and also some of the meat trade resulting in this slightly better outcome for hogs. Never-the-less the key point is: in the long run a corn price impact will not have a tremendous impact on hog production returns. Hogs are a margin business – buy feed, sell pork and return on investments tend to return to their mean in a margin business. If a producer can survive the transition lag as hog production and prices adjust to their new equilibrium, there may be no more incentive to develop procurement strategies than before the ethanol boom – unless you believe we will truly 'run out of corn' in which case, hogs will probably lose that bidding war.

**Slide 14:** No Notes

**Slide 15:**

The most obvious strategy to overcome corn procurement is to consider substituting DDGS in the diet. Most are well aware of this work.

**Slide 16:**

DDGS have followed corn prices and therefore don't create much benefit and what benefit they do create at these prices is due to protein value. Key is what happens going forward and this is very hard to predict. More corn and more DDGS will be available but technologies for non-feed uses are increasing which will increase demand for DDGS beyond use as a feed product. So while some expect them to get much less expensive others see them continuing to follow corn prices. The point, however, is to develop a plan for incorporating DDGS into hog operations if they are low cost or if corn availability gets tight so you can source some feed. This includes issues such as handling DDGS in the feed systems, proper diet formulations, sourcing DDGS from a consistent supplier, effectively pricing DDGS and other similar issues.

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**Slide 17:**

As shown on the right hand yellow column. If DDGS are used at current price relationships, there's only a moderate benefit, but it can help reduce cost of feed impact and perhaps save some costs of other strategies. As described earlier the key is what happens to prices of DDGS going forward. Consistent with the theme of this paper is to be proactive in preparing for procurement of DDGS. Consider nutrition issues including dietary inclusion rates, quality variation, feed handling, hauling, meat quality effects, etc. Be ready now, so that if worst case scenarios occur on corn prices and demand this may become a viable risk mitigation strategy – especially if we have a mountain of DDGS and the prices do fall. Work by Vernon Eidman in Applied Economics suggests we certainly won't have enough animals at current inclusion rates to feed all DDGS.

The 10% inclusion rate is low because it appears DDGS can be fed to 20% but results indicate there are some performance issues that begin at that level and it's harder to make a valid economic comparison. The key issue appears to be the variability of DDGS and the ability to formulate them effectively into diets.

**Slide 18:**

Recent work we've completed on a pig flow model for space allocation in a complete three site farrow to finish system suggests there are significant economic tradeoffs in pig flows, market weights, stocking densities and carcass quality premiums in packer matrices. Although a very large and complicated model, it could be converted to address this issue. My experience using that model suggests we could back down the weights, move back before the inflection point on growth curves and stock at higher rates (i.e., turn more pigs through facilities) and save substantially on feed while still hitting target market weights. Remember it's all about substitution now and this is a strategy that will emerge for mitigating price effects.

**Slide 19:**

Using procurement strategies such as futures and forward contracts are generally more complicated and can induce substantial transactions costs. While we can look at opportunities, I prefer to pursue strategies that require no specialized knowledge and avoid the potential for making more mistakes to compound the problem – in other words, the marketer's version of the Hippocratic Oath – “first do no harm”.

**Slide 20:**

If we see any mountains of grain it might be stacked up in front of an ethanol plant!

**Slide 21:**

The key to a procurement strategy, just like a marketing strategy, is planning and action. Most of this is common sense but is a bit confusing because in agriculture we tend to be focused on marketing (product sales) rather than procurement (product purchases). I always start with the premise that markets are efficient and therefore there are no apriori strategies that work 'every time'. This means the market gives average returns to average prices and the best pricing you can hope for is average. Even speaking with agribusiness grain procurement experts if they are in the 51st percentile of price they consider the strategy a success. Regarding spreads, assuming it's impossible to consistently beat the market, the best baseline strategy is to create a portfolio – in other words hold multiple positions and spread the risk taking natural hedges where they arise. Usually we think of a portfolio as a large number of different stocks or other

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**Slide 21 continued:** assets. However, we can also create time portfolios (taking ownership in different price periods), different instruments (futures some forwards – analogous to holding mutual funds while also holding stocks –why? Because there are some pros and cons to each) and the ultimate portfolio concept creating a hedge or a true spread. Some can be simple, some can be complex, but all have a role to play in spreading out the risk of prices and delivery.

**Slide 22:**

The reason there are brokers is because these three strategies can be used in innumerable situational strategies. However, they provide a base upon which all else is build. Hand-to-mouth is really just price averaging or income averaging the others require obvious market strategies.

**Slide 23:**

Futures markets have some real shortcomings – relatively high transactions costs (margins, commissions, non-contract months, incremental quantities) the biggest issue in this case is delivery – you actually will use the corn. This entails basis risk and other issues. Given the context of this presentation, and my ultimate conclusion that to obtain localized grain you need to deal at a local level makes private forward contracts prevail as a long term strategy.

**Slide 24:**

Grain marketing is fundamentally different than hog marketing because it is a storable commodity, while hogs are not. The importance of this is that the storability provides some additional predictability on basis and marketing decisions which can give you a procurement edge. You still won't know if prices in general are going up or down, but by knowing these relationships you may be able to give yourself a 10-20 cent per bushel edge in pricing.

**Slide 25:**

As we've seen in 2006, corn prices don't always follow seasonals – but odds are they do. Your goal should be to put the odds in your favor and be sure to price a portion when seasonal lows are there. Don't buy all your needs because there may be opportunities later and the goal is to spread risk, but buying at least a percentage during normal seasonal lows will help tip costs in your favor over the long run. Get familiar with key crop information patterns to. Every year the crop intentions report comes out in the spring, this is the first report for the next crop year that people react to. It's main purpose is to forecast acreage. The next stage of course is spring planting and this is where weather starts to come into play, wet springs, dry springs, cold springs, etc. all begin to shape the market. This is where major rallies start (usually we don't see big drops) – any weather in May, June, July becomes big price movers. In August the market starts to gain certainty as the crop matures. This is the point we 'think' we know where we're at and even with a weather rally the market can take a breather. The final push is harvest and perhaps early frosts. This is where the rubber hits the road, another time of volatility. The point of this is that unlike hog markets which are highly unpredictable (other than cycles and seasonals) crop markets have a much richer within year pattern that you should learn to interpret and more importantly anticipate in your marketing plans.

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**Slide 26:**

This chart show basis since 2000. Storable commodities almost always have negative basis (i.e., cash prices are less than the futures price) because of carrying costs. Hence on the next slide one can just look at basis and interpret carry too. In this case, ending basis is 10 cents under for December. If you write a forward contract for delivery in December, one way to price it is 10 cents less than the December futures price on a local basis. The same logic applies for other contract months. Even if you don't use futures contracts for pricing they are the market for price discovery and are useful for evaluating other marketing strategies and pricing forwards.

**Slide 27:**

July responds similar as basis in December. Note the breakout chart on the lower right corner. The greater the slope of the basis, the higher the carry in the market – the more incentive there is to hold grain in storage and sell it later. If there's a large carry in the market it pays to buy the corn up front and hold it rather than have it delivered later. Carry changes from year to year depending on stocks and use throughout the year.

**Slide 28:**

On paper it's nice to talk about forward purchasing but if you do so with corn, you will incur costs. If you forward contract, the seller will likely charge you a carry if you ask them to hold it for delivery, if you buy futures your cost will not include physical carry, but will include the costs of interest on margins and also convenience yields which can include in the worst case executing delivery on a futures contract if the local market is tight. Managing this carry is a key transaction cost. However, by understanding it and accounting it, you can use forwards more effectively by using strategies that minimize the costs and put the odds in your favor.

**Slide 29:**

A key component of storable commodities is always the cost of carry. More distant futures within a production year are priced typically at higher levels than nearby contracts. In this illustration Dec Corn is always lower than Sep Corn. If it were not, no-one would every 'carry' corn forward in time by storing it – you would want to sell it right away. This was one of the fundamental reasons for futures markets. Without the forward price provided by futures and some assurance that indeed a market would be there in the future, farmers 'dumped' product at harvest and therefore, harvest prices were depressed and shortages occurred later in the year. Hog markets do not exhibit this behavior because they are a non-storable commodity and they are 'anticipatory' commodities where prices are based almost exclusively on expected supply and demand. The carry in the market can be an advantage because it is predictable and stable over time.

**Slide 30:**

You eliminate physical carry with futures, but incur some convenience yield risk. Carry will be lower (i.e., low incentives to store) when crop supplies are generally short in the fall, so the convenience yield gets higher – so this is not always a good trade, but the odds are again in your favor and you can require delivery. In the case of a large carry, you can actually buy the corn up front, store it and sell the futures contract. In the end, you will gain the difference between the storage cost and the futures sale price and make a little money on the side – this is a carry-hedge and is used frequently by grain elevator managers.

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**Slide 31:**

Convenience yields are simply the value you place on having immediate access to grain and also no risk of shortages when needed in the future. This is difficult to determine. It depends on our ability to adjust operations to shortages as well as your risk profile. There are ways to determine this but they are calculated from financials— if you pay more than your profit margins, your convenience yield is too high.

**Slide 32:**

Christensen Farms has entered a joint program with Cargill for grain origination. Cargill AgHorizons has done this for about 9 years through their Ag Horizons program which simply focused on Cargill's grain origination (i.e., procurement) strategies for their country and terminal elevators. This shows it's possible to adapt these grain industry practices to the swine industry.

**Slide 33:**

These are AgHorizons' own solutions. Each of these solutions has a different objective FOR THE PRODUCER. Cargill's objective is always to procure grain and manage price risk. However, all growers have different objectives and the payouts and structures of the contracts fit the different types of growers. This enables them to get a competitive advantage over other grain purchaser who don't offer these alternatives and AgHorizons can compete for grain on something other than just price. For example they offer bin agreements where they provide a grain bin as part of the agreement.

**Slide 34:**

Hog producers will need a 'hook' to compete grain away from other buyers. This only raises the example that manure can be swapped for price and procurement similar in logic to what AgHorizons does. Although in the early stage of thinking, manure is likely the main competitive advantage livestock producers may have in attracting farmers to deliver corn to them instead of the shuttle loader or the ethanol plant down the road. The value of manure may increase even more as we go to corn-on-corn rotations if corn demand increases as much as we think. Therefore, the pork industry should consider development of forwards that tie in manure as a key part of the agreements.

**Slide 35:**

Like most of this presentation we could talk about this for an hour by itself. But I want to raise the point that if we're going to lock corn, we should probably also be locking hog prices. With long term contracts, this may actually be easier because the hog price is already in a range and so the producer can better identify break-even corn prices which offer pricing opportunities. Although I haven't included a slide here, all of this goes without saying that it will be imperative that growers know their breakeven cost of corn to know what 'good' corn prices are.

END