Land O'Lakes Purina Feed LLC

Swine Technical Bulletin

High Production Costs
What's Going On, And What Can We Do About It?

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There are a number of reasons why production costs are higher today; weak economy with cautious consumer spending; high energy prices and of course, energy prices are tied to all goods; an abundant meat supply including pork, cattle and poultry, with 20% plus of our pork being exported. We have a tight supply of corn in addition to weather issues such as drought and floods causing issues with all feed ingredient production.

Table 1[1]

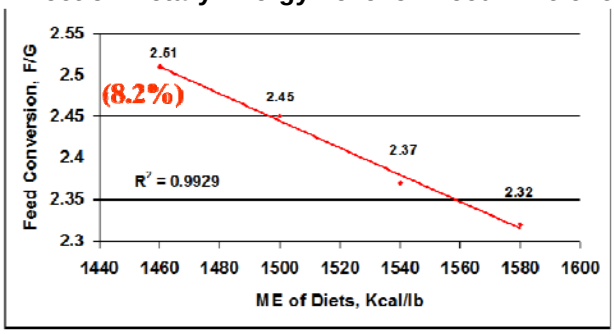
Corn Usage	Percent
Ethanol	37.0
Feed	37.0
Food, Industrial	10.0
Export	16.0
	100.0

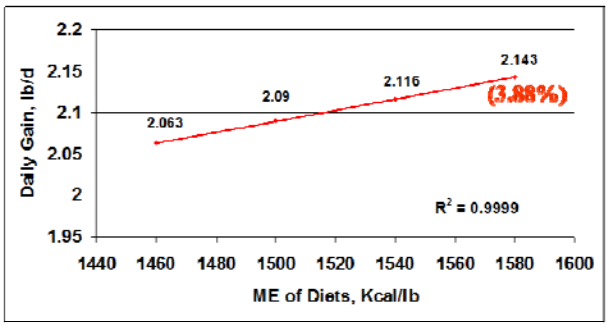
Corn usage across America is broken down as in Table 1 and as prices go up, supply will be deviated to those that will pay. What are the alternatives we can use in animal feed?

- Other Feed Gains
  - Wheat, Barley, Sorghum (Milo), Oats
    - But they are regional, with limited supply
- Food By Products
  - Fat, Bakery
  - Midds, Hominy
- Ethanol By Products - DDG, DDGS

Most of these substitutes are lower in energy than corn. How does this affect pig performance?
A pig will attempt to eat to meet its energy requirement, thus if energy levels are lower, feed intake will increase. On the contrary, pigs fed higher energy dense diets will typically consume less feed (lb/day) and consume more energy (kcal/day). Two graphs from PIC North America depict this well:

Effect of Dietary Energy Level on Feed Efficiency and Daily Gain





L.S. Means calculated from 709 PIC405xC22 pigs with an avg initial weight of 28 kg and an average end weight of 124.3 kg.
Ref: Extracted from a presentation by Dean Boyd at a Land O'Lakes Farmland training event called Miniversity held in 2002 in Kansas City

Although average daily gain is important for facility throughput and may influence cost of time and market manipulation, it is highly likely as costs continue to increase that **Feed Conversion is likely to become the "Driver of the Future".** Feed conversion can be measured many ways:

- Pound of Feed per Pound Live Pig Weight
- Pound of Feed per Pound Carcass Weight
- Energetic Efficiency
  - Kilocalorie per Pound of Carcass Weight

Feed Conversion can be significantly modified by a number of factors, for example genetics, the pigs' ratio of lean versus fat deposition and the nutrient density of diets, including macro-minerals and amino acids, with some data suggesting that we are under-supplementing lysine for todays advanced genetics.

One of the difficulties we face is the **large variability in quality of some feed ingredients**, such as DDGS. It is clear that variation increases with number of plants or sources since not all DDGS are produced the same (fractionation, % syrup, oil removal, drying). We have realized that our laboratory analyses are valuable to establish our ingredient nutrient profiles and animal performance is required to validate our assumptions. A worrying trend is the latest cash cow for ethanol plants, inedible corn oil. Plants receive $0.11 for DDGS vs. $0.40 for oil. Fueled by a federal tax credit, a third of the plants now have the technology installed to remove 1-2% of oil, producing lower energy DDGS, and as technology improves, more fat will be removed. A key tip when buying DDGS, is know what you are getting! Fat can range from 7.91% to 13.06%, averaging 10.66%. Added to that is the variability in phosphorus, ranging from 0.59% to 1.12% and averaging 0.84%.

Feed processing can have a significant effect on efficiency particularly, pelleting and particle size. Pelleting can help with high fiber diets, bulk density, handling and reduces feed waste. Trials[2] have demonstrated a 6% improvement from pelleting in Feed/Gain in grow-finish, higher in early nursery although the benefits are lost with 20-40% fines in the diet. Particle size reduction has been well proven with grain; where a 1.0 - 1.5% F/G improvement is obtained per 100 micron reduction. We have used 700 micron in the past as a target for grain particle size. Higher fiber DDGS diets seem to have reduced the ulcer concerns and we find some producers reducing grain particle size below 700 microns. It is not uncommon to find producers reducing grain particle size down to about 500 microns, although this will increase power requirements for milling and may create feed handling difficulties. Questions remain regarding the optimum particle size for soybean meal and DDGS.

Feed Ingredients have been a key element in trying to optimize feed efficiency for a long time and their importance is growing. Thumb rule is we can get some measured improvement in feed conversion with antibiotics (2-7%), copper sulfate (3-4%), NEWtraStart™ Feed (3%), EcoCare® Feed (1-2%), PayLean (10%). Phytase may be able to improve phosphorus ultilization but we're replacing inorganic phosphorus with corn. Other enzyme additives such as amylases, carbohydrases, proteases, etc. promise lower fat and soy requirements in the diet which means potential decreased diet cost; however, there is very little controlled data in swine to prove consistency and enzyme effect is very hard to prove on farm.

An important aspect of improving feed efficiency is **on-farm operational efficiency**. Take note that the following are monitored accordingly for maximum effect; animal health, air quality, water quality and quantity, room temperature, floor space, correct feed budget and diets, feeder adjustment, and split sex feeding where possible.

In summary, what we can expect as feed production costs rise are,

- **higher fiber, lower energy diets**
- **pigs may slow down in growth**
- **feed efficiency is likely to be the driver**
- **lowest cost diet may not be the best**
- **use all of the technology available**
- **more manure, dry matter, and volume**

[1] World Agriculture Supply and Demand Estimates, USDA, NASS, July 12, 2011. WASDA 496, ISSN 1554-9089.

[2] National Swine Nutrition Guide, Factsheet, Pork Information Gateway, Swine Feed Processing and Manufacturing. Authors: Brian T. Richert, Purdue University & Joel M. DeRouchey, Kansas State University. PIG 07-04-03.

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