Reducing the Cost of Pig Diets

Authors
Peter J. Lammers
David R. Stender
Mark S. Honeyman

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The cost of pig diets is set by the cost of ingredients. It also can be influenced by feeding the correct diet to the pigs based on genetic growth potential.

The size variation in the pen also impacts feed cost. The size of pig will change nutrient requirements with smaller pigs requiring more nutrient dense diets. A producer is overfeeding the larger pigs and/or underfeeding the smaller when there is wide variation in pig size within a pen. Either case can be costly.

It is possible that a lower cost diet with a poorer feed efficiency may have a more competitive feed cost per pound of gain. Actual data from nine niche swine operations showed these operations paid an average $133.40 per ton of feed (not organic feed) with a 4:1 feed conversion ratio. The average cost of gain can be calculated:

$$Feed\ Cost\ per\ lb\ of\ Gain = Feed\ Conversion\ Ratio \times Diet\ Cost$$

$$Feed\ Cost\ per\ Head = Feed\ Cost\ per\ lb\ of\ gain \times Gain$$

Table 1. Feed cost calculations for 4 case study farms.

	Case Farm			
Measure	1	2	3	4
Feed conversion	4.0	4.2	3.6	3.4
Diet cost, ¢/lb	5.25	8.59	5.60	7.92
Gain, lb	270	270	270	270
Feed cost/gain, $/head	57	97	54	73
Difference, $/head	+ 3	+ 43	–na–	+19

In this example, Case Farm 4 had the best feed conversion, yet feed cost per gain for that operation was above average. Case Farm 1 had the lowest priced feed and a 4:1 feed conversion resulting in a feed cost of gain of $57/head ($21/cwt) or $16/head less than average. Farm 3 had the best feed cost of gain because it was able to put together the best combination of feed conversion and diet cost.

Baseline Feed Budget

A baseline feed budget enables producers to evaluate the impact of changing feed prices, and the impacts of changing feed conversion and herd productivity. Before an additional product that may improve performance is added to the diet or a lower cost feed ingredient is used, the cost effectiveness of that change can be compared.

Table 2 presents a baseline feed budget using typical 2005 feed costs and assumes a feed conversion of 3.48 for a 270 lb pig.

Table 2. Baseline feed budget to produce one, 270 lb pig[1].

Ingredient	Quantity	Price[2]	Cost/hd
Corn	785 lb	$0.032/lb	$25
Soybean meal	130 lb	$0.09/lb	$12
Base mix	25 lb	$0.25/lb	$6
Total	940 lb	$91.48/ton	$43

[1] Assumes feed conversion of 3.48 farrow–to–finish (including sow feed) and 17 pigs/sow/yr.
[2] Typical feed costs for 2005.

In this example, 14 bushels of corn (785 lb/56 lbs per bu.) are used by each 270 lb pig. Thus each hundredweight of gain requires about 5 bushels of corn. Therefore,

for each $0.10/bu increase in corn price, the cost of production increases by about $0.50/cwt.

$$\frac{14\ bu\ corn}{2.7\ cwt} = 5.2\ bu/cwt$$

$$5.2\ bu/cwt \times \$0.10/bu = \$0.52/cwt$$

Similarly, a $10/ton increase in soybean meal increases the cost of production by about $0.24/cwt.

$$\frac{130\ lb\ SBM}{2.7\ cwt} = 48.15\ lb/cwt$$

$$48.15\ lb/cwt \times \frac{\$10/ton\ SBM}{2000\ lb/ton} = \$0.24/cwt$$

In 2005, average farrow-to-finish niche market herd feed costs were $65 per pig. Differences in feed conversion, sow productivity, and price of ingredients will change the relative impacts. Niche producers should use records from their own operation to develop a baseline feed budget for their operation and evaluate the impact of changing feed prices, feed conversion, and sow productivity.

Matching Pig Requirements to the Market

Formulating a diet based on growth rate means less protein is needed in the diet for a slower growing pig. Feeding slower growing pigs a diet with excess protein will not make them grow faster. Protein in excess of need for growth is used as energy but it is used less efficiently than starch. Overfeeding protein does not affect growth rate, but does result in leaner pigs. This may be counter productive for a niche market that is looking for a fatter pig.

Because many niche pork markets have a goal of producing a pig with more than average fat, there is an opportunity for some herds to reduce feed cost. Expensive feed ingredients designed to maximize lean growth may not be desirable in some niche systems because lean hogs may be discounted. Protein level should be set to maintain adequate growth rate, but additional protein is not useful at levels that make the carcass leaner.

In contrast, a typical diet for lean commodity pigs usually has nutrient safety margins in the diet to insure maximum lean growth rate potential from the feed. Because of this, extra protein is not wasted on a conventional pig because it tends to make a carcass leaner.

Weight Variation in Feeding Pen

Large weight variation in the pen and/or misestimating the weight of the pigs can add expense to feeding a pig. Missing the pig's requirement will either increase the cost of diet or decrease performance. Having small pigs in a pen with larger pigs is a problem. Formulating the diet for the small pigs will increase the feed cost of the larger pigs.

However, consistently underfeeding the nutrient requirement of the smaller pigs may slow their growth rate even more. If the small pigs are small because of a disease setback or because of small birth weight, more nutrient dense diets are not likely to help them grow much faster. However, if the small pigs in the pen are healthy and small because they are younger, they will respond favorably to more nutrient dense diets.

Facilities and Overhead Costs

Facilities and overhead costs also impact the financial decision of the level of nutrients in the diet. Operations with limited finishing space and/or higher value facilities will be impacted financially by slower growth rate, but increasing daily gain has little value to operations with excess finishing space and/or depreciated facilities. If fast growth rates are not beneficial, feed cost can usually be reduced by formulating

for a slower growth rate. Again, records are necessary to make this determination.

Creep Feed Cost

Minimizing the cost of creep and nursery feeds is a strategy to reduce feed cost in niche market herds. Baby pigs cannot digest soybean meal very well. When pigs are weaned at less than three weeks, they need a complex diet of milk products and other highly digestible feedstuffs that is very expensive.

Niche market producers who wean a bigger pig at an older age have the opportunity to use a less expensive feed because the piglets rely on sow's milk longer. This allows the pig to become acclimated to soybean meal while still consuming sow milk. Feeding the piglet a simple corn-soybean meal-whey low-cost creep feed while they are nursing will acclimate the pig stomach to soybean meal protein. The creep feed can continue to be fed after weaning.

Growth Promotants

Extra products such as zinc oxide, copper sulfate, or probiotics sometimes are added to pig diets as a tool for aiding herd health and/or animal performance. These products need to be evaluated periodically on a case-by-case basis for effectiveness and cost/benefit ratio. Keeping and understanding financial and production records are critical in making decisions regarding adding extra products to enhance performance and health. Extra products should increase operational throughput by increasing breeding productivity, decreasing death loss, or increasing growth rate.

Additional Resources

Iowa State University Extension. 1996. Life Cycle Swine Nutrition. PM-489. Iowa State University. Ames.

Purdue University Extension, 2007. Relative Value of Feedstuffs for Swine, The New Pork Industry Handbook–07-06-03. Purdue University. West Lafayette, IN.

U.S. Pork Information Gateway http://pork.porkgateway.org/web/guest/home