Managing Tough Times

Impact of Increasing Feed Prices on the Optimal Market Weights and Marketing Strategy of Finishing Pigs

EXPERT REVIEWED

Allan Schinckel

Paul Preckel

Mark Einstein

Todd Hubbs

Brian Richert

Animal Sciences and Agricultural Economics

Purdue University

The optimal market weight for pigs is affected by the relationships of feed conversion and predicted carcass value to body weight. Pigs selected for increased lean growth maintain greater lean growth rates and better feed conversion to heavier weights than average lean growth lines. Carcass value is highly correlated with the amount of trimmed lean cuts and percent carcass lean. The purpose of this fact sheet is to help pork producers evaluate the impact of higher feed prices on the optimal market weight and choose what is the best weight to sell their pigs.

To demonstrate the impact of different genetic populations and sexes on optimal market weights, a simple model was developed. Actual data was available for high lean growth terminal cross pigs with greater than average lean growth rates and better than average feed conversions to heavier weights. These pigs had individual feed intakes from 70 days of age to target market weights of 250, 280, or 310 pounds. The serial body weight and daily feed intake data were fit to nonlinear functions. The carcass backfat and loin depths were fit to allometric functions of body weight.

Two alternative genetic populations were modeled with average and lower than average lean growth rates but with the same body weight growth rates as the high lean gain pigs. This resulted in more rapid increases in backfat depth and decreased rates of loin depth after 200 lbs. body weight. The energy cost of the increased lipid accretion and decreased protein accretion was used to predict the daily feed intakes of these two other genetic populations. The actual percent lean and feed efficiency from the high lean gain and modeled average and low lean gain pigs are shown in Figures 1 to 4. The optical probe backfat depths of the gilts were 0.65, 0.78 and 0.91 inches and the barrows 0.78,

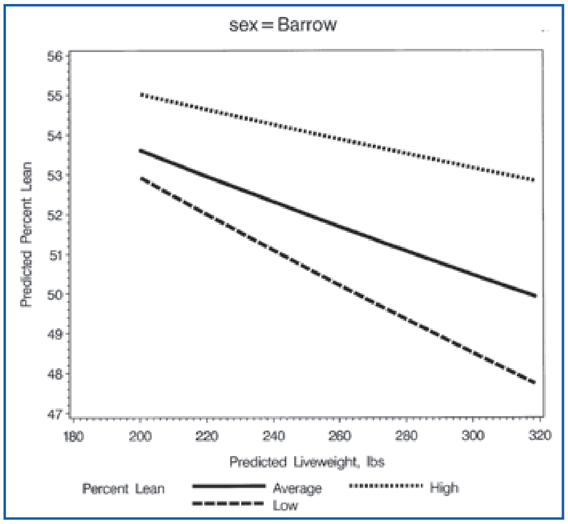

Figure 1. *Predicted percent lean of three genetic populations of barrows relative to body weight.*

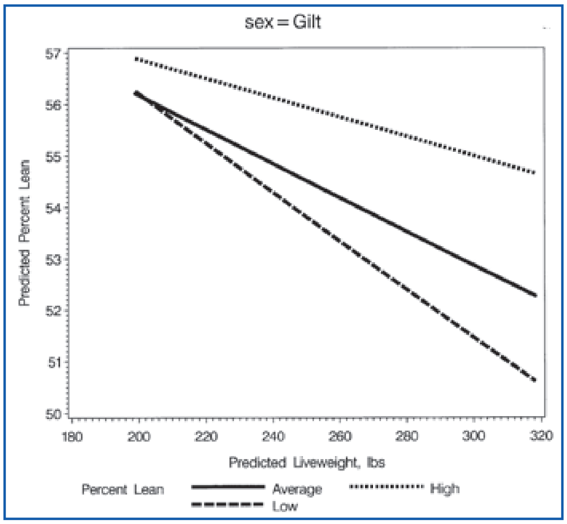

Figure 2. *Predicted percent lean of three genetic populations of gilts relative to body weight.*

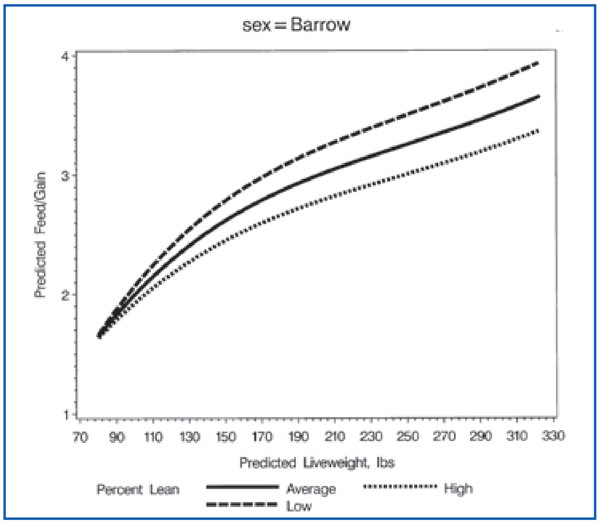

Figure 3. *Predicted feed conversion for three genetic populations of barrows relative to body weight.*

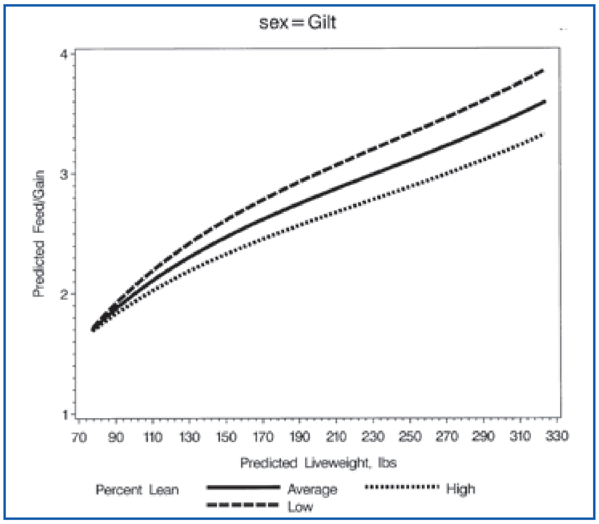

Figure 4. *Predicted feed conversion for three genetic populations of gilts relative to body weight.*

0.94 and 1.10 inches at 280 lbs. body weight for the high, average and low lean growth pigs.

The predicted backfat depths and loin depths were used to predict percent lean for the equations currently used by Tyson's, Indiana Packers Corporation (IPC), and Farmland Foods. The predicted carcass weights and predicted carcass lean percentages were used in each pork processors market value pricing system. The market weight that maximized the profit of each genetic population-sex group for each pork processor was predicted.

It was assumed that pigs were purchased from a nursery site at 70 days of age. Pigs were fed a total of five dietary phases over the grow-finish period. Feed composition was based on standard corn-soybean meal diets that included synthetic lysine (constant, 0.15%), and a vitamin-mineral premix. In addition, the cost of each diet included a $12/ton grinding, mixing and feed transportation cost.

Base prices of $2.50 per bushel for corn and $190 per ton for 48% CP soybean meal were used, which represented average prices in the past. To reflect increased grain prices relative to market price, the prices of corn and soybean meal were increased in 20% increments to 2.4 times the original base values. At current corn ($5.70/bu) and SBM ($330.00/ton) prices, this would place most producer's feed costs at the 2.0-2.2 relative cost level on Figures 5-10. With predicted future prices near $6.00/bu the relative feed costs would be between 2.2 and 2.3 in figures 5 to 10.

Veterinary expenses, medication, and death loss were included into the $0.09/day variable costs. A ten-year average live weight price (1991-2000) of $42.00/cwt ($56.00/cwt carcass) was used as the base market price. Transportation costs at the point of marketing were determined to be $2.00/head. Three pork processor carcass value systems were evaluated: Tyson Foods, IPC, and Farmland Foods.

The daily feed intakes, the body weights, carcass weights and percent lean were predicted for the average barrow and gilt of each of the three genetic populations. The optimal profit per pig was estimated as the day in which the profit was maximized or, in the case of high grain costs, the losses per pig were minimized.

The optimal market weights relative to feed costs are estimated for the three genetic populations are shown in Figures 5 to 10. The optimal market weights of the high lean gain pigs were not greatly affected by the relative cost of corn and soybean meal. Even when increased feed costs resulted in overall losses, the marketing grids encourage market weights at the upper acceptable carcass weight for each pork processing grid.

The medium lean gain gilts optimal market weights were lighter (278 versus 298 lbs.) for the Tyson grid than the high lean gain gilts. The optimal market weights of the medium lean gain barrows decreased as the prices of corn and soybean meal were greater than two times average prices (i.e., $5/bu corn and $380/ton SBM, near current prices).

The low lean gain gilts had similar market weights as the medium and high lean gain gilts up to 2.0 times average feed prices. With greater corn and SBM prices, the optimal market weights of the low lean gain gilts decreased substantially with all marketing grids.

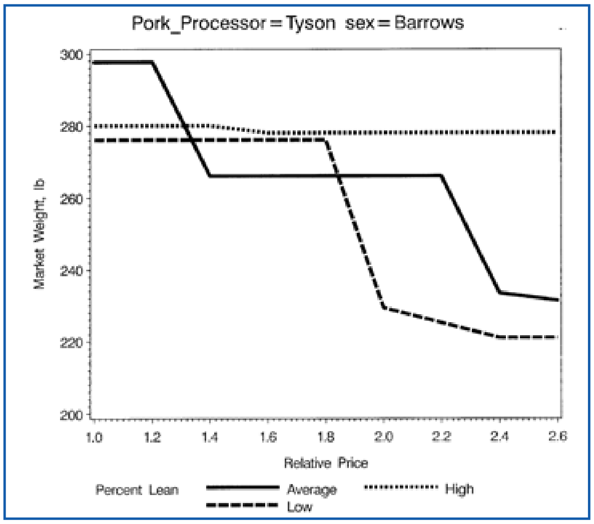

Figure 5. *Optimal market weights for three genetic populations of barrows marketed to Tyson Foods relative to increasing feed costs (base 1.0 = $2.50/bu corn and $190/ton SBM).*

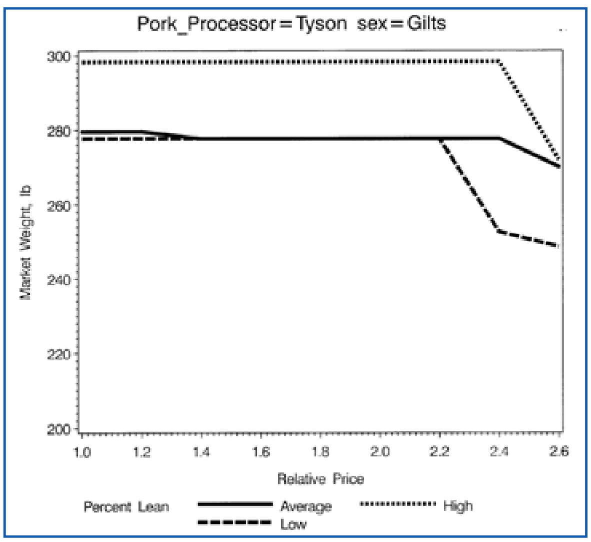

Figure 6. *Optimal market weights for three genetic populations of gilts marketed to Tyson Foods relative to increasing feed costs (base 1.0 = $2.50/bu corn and $190/ton SBM).*

The low lean gain barrows had similar optimal market BW's to the medium and high lean gain barrows at average feed prices. However, as grain prices increased to a relative ratio of about 1.80, the optimal market weights of the low lean gain barrows (avg 50% lean at 265 lb) decreased to 220 to 225 lbs. with all three marketing grids.

The major factor determining the optimal market weights is the pork processor's magnitude of premiums and discounts for carcasses of different weight ranges. The secondary factor is the market weight in which the

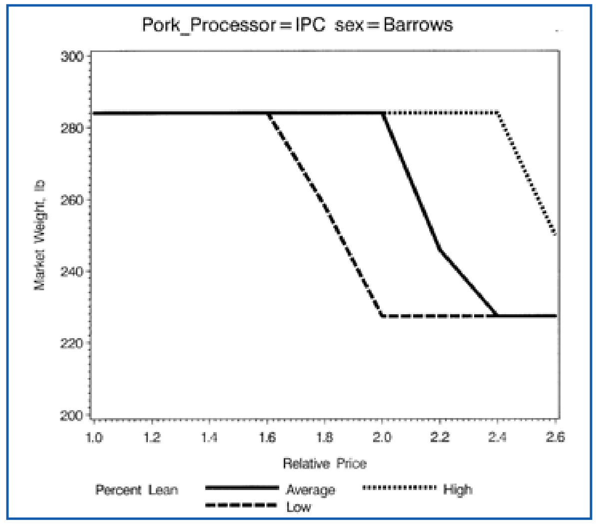

Figure 7. *Optimal market weights for three genetic populations of barrows marketed to Indiana Packers Inc relative to increasing feed costs (base 1.0 = $2.50/bu corn and $190/ton SBM).*

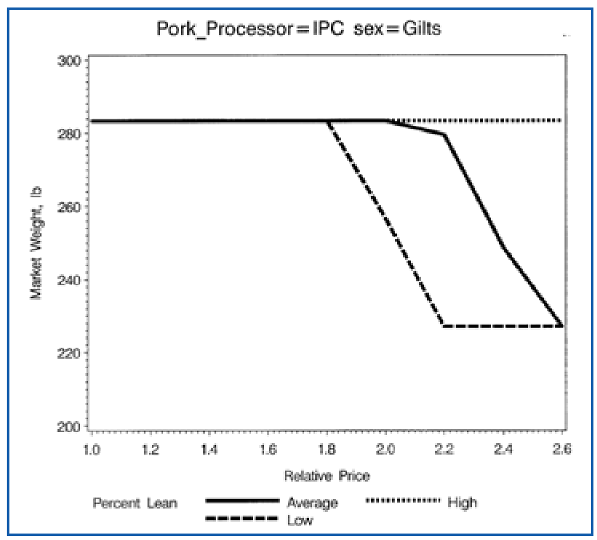

Figure 8. *Optimal market weights for three genetic populations of gilts marketed to Indiana Packers Inc. relative to increasing feed costs (base 1.0 = $2.50/bu corn and $190/ton SBM).*

pigs drop from one predicted percent lean cell on the marketing grid. The optimal market weight barrows sent to Tyson Foods was impacted by the weight in which each of the three genetic populations of pigs moved from one predicted percent lean cell to a lower percent lean cell. The mean high lean gain barrow modeled in this example dropped from one percent lean cell of the Tyson Foods marketing grid to a lower percent lean cell at approximately 280 lbs. market weight. The medium lean gain pig had a lower percent lean than the high lean gain pig at all market weights. However, from 270

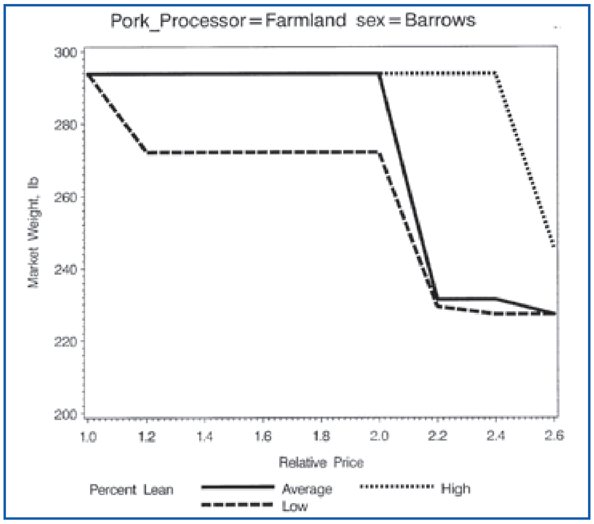

Figure 9. *Optimal market weights for three genetic populations of barrows marketed to Farmland Foods relative to increasing feed costs (base 1.0 = $2.50/bu corn and $190/ton SBM).*

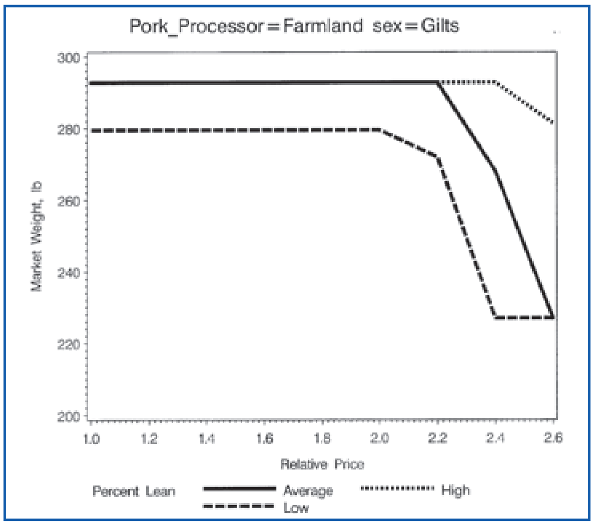

Figure 10. *Optimal market weights for three genetic populations of barrows marketed to Farmland Foods relative to increasing feed costs (base 1.0 = $2.50/bu corn and $190/ton SBM).*

to 295 lbs. market weight, the medium lean gain pig did not drop from one predicted percent lean cell to another.

The profits per pig were estimated to demonstrate the impact of high lean growth pigs on profitability through improved feed efficiency and increased market prices based on greater predicted percent lean. The average estimated differences in profitability of the high lean genetics relative to the average and low lean pigs was $7.00 and $16.00, respectively and the average to low lean gain pigs was approximately $9.00. However, these values varied depending on the grain prices and the pork processor.

The results indicate that when feed prices are high relative to market prices, the optimal market body weight to minimize losses per pig can decrease to the body weights which result in carcass weights just above the pork processors lowest acceptable weight. Pigs with average and below average lean growth rates that have poorer feed conversion and more rapid decreases in percent lean with increased body weights have decreasing optimal market weights with relatively lower feed prices than high lean growth pigs. Pork producers need to have information on the relationship of feed conversion and predicted carcass lean percentage for their pigs to estimate optimal market weights for their pigs. The optimal market weights to maximize profits or minimize losses per pig are affected as the prices of corn and soybean meal change relative to market price fluctuations.

The purpose of this example was to help pork producers evaluate the impact of higher feed prices on the optimal market weight for their pigs based on maximal profit per pig or minimal losses per pig. In reality the pork producer must sort pigs and market semi-loads of pigs and then empty and refill the barn so as to maximize average daily returns above feed and variable costs. For cases in which the optimal market weight is at or very close to the top of the pork producers acceptable carcass weight range, semi-loads of pigs can be sorted whose market weights are 7 to 10 lbs. lighter than the optimal weight range. Then at some point, the grow-finish facility is emptied and the multiple semi-loads of pigs have a distribution of market weights over the entire acceptable carcass weight range for the specific pork processor. However, if the producer has average or below average lean growth pigs and feed costs are high relative to market prices, then the optimal marketing strategy to minimize losses may be to sell semi-loads of pigs when they achieve the pork processors lowest acceptable carcass weight. This could mean sorting multiple semi-loads of pigs just above the pork processors lower acceptable market weight (in most cases 230 to 240 lbs.) with few pigs marketed at weights significantly above this minimum acceptable weight.