

SWINE PROFITABILITY CONFERENCE

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“When, Where and Why: Marketing Decisions
Based on Packer Matrixes and Pig Flow”



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When, Where, and Why: Marketing Decisions Based on Packer Matrixes and Pig Flow

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We spend considerable time finding ways to shave nickels and dimes from the cost of production. Marketing is an area where dollars per pig are lost every day due to either getting the wrong pigs on the truck, not having enough space to allow pigs to reach the ideal market weight, or by having a group of pigs get away from you and slide off the top of the packer matrix. Signals sent from the packer to producers are often confusing and change over time. We also know that the current volatility in swine and grain markets has an impact on the ideal market weight. High grain and low hog prices will lower the ideal market weight, but just how much is often difficult to determine without in-depth analysis.

Many processors also have made recent grid changes to reinforce their message on the desired market weights for their system. For example, because they had developed a reputation for paying better than other packers for light weight pigs, Farmland (2005) and Tyson (2007) increased discounts on lighter weight market pigs to decrease the flow of these pigs to their plants. Triumph had developed a well-deserved reputation for accepting very heavy pigs. Thus, they recently (2007) greatly increased the penalty on very heavy (>350 lb) pigs making it a major penalty to market any pigs over this weight.

In an attempt to improve the signals being sent on their desired weight and quality characteristics, processors have increased data access to producers. Our goal in this paper is to help you use this data to make management decisions. The two main uses for the data that will be discussed are: 1) to determine the optimal market weight for loads of finishing pigs: and 2) to improve communication with people loading trucks in order to get the right pigs on the right truck.

Determining the optimal market weight.

For the first exercise of determining the optimal market weight for loads of pigs, data can be either provided electronically by the packer or input by hand into a spreadsheet. A third option is to use analysis that has been conducted on data provided by others marketing to the same processor. In our experience, using data provided by others will often predict a similar ideal market weight, but is less accurate at predicting the actual cost of selling pigs that are lighter or heavier than the optimal weight than if the data was from within the production system.

The steps to follow in collecting data are relatively simple for somebody with spreadsheet skills. Hand entering the data is the most time consuming and error-prone step. Thus, if you can obtain the data in electronic format, it greatly reduces the time required. Once you have the data assembled, if you don't have the necessary spreadsheet skills, somebody with the spreadsheet skills can complete the analysis steps relatively easily.

Steps to determine optimal market weight:

- 1) Obtain data in electronic format or record data from packer sheet in a spreadsheet (example spreadsheet available at www.KSUswine.org as “KSU Marketing Template”)
 - a. Date
 - b. Number of pigs
 - c. Base price (\$/cwt carcass)
 - d. Sort loss
 - e. Lean premium
 - f. Gross value (\$/cwt carcass; Price before checkoff and trucking are removed)
 - g. Any other price alterations
- 2) Graph main variables or sort them to look for outliers (data entry mistakes)
- 3) Calculate difference between gross price and base price in \$/cwt carcass
 - a. Should be sort loss + lean premium + any other alterations or simply the calculation of gross value (price) – base price
- 4) Graph the difference between gross price and base price against market weight (ex. in Figure 1)
- 5) Fit quadratic regression equation through the data
- 6) Input the regression parameters into the “customized” sheet in the “KSU Market Weight Predictor” spreadsheet (available at www.KSUswine.org).
- 7) Input current cost of last diet fed
 - a. If Paylean is being used, the last diet that is fed before the Paylean diet should be used because we normally adjust the amount of this diet that is fed and feed a similar amount of the Paylean diet to each group.

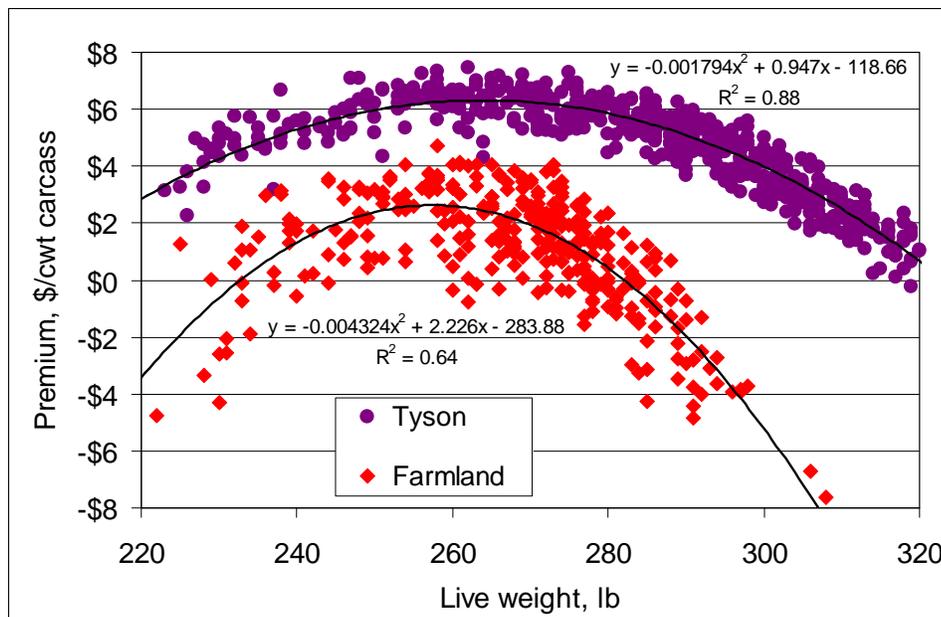


Figure 1. Influence of market weight on premium (gross value - base meat price in \$/cwt carcass)

The example in Figure 1 demonstrates the premium in \$/cwt carcass at two packers (Tyson and Farmland) for one production system. These data are from before the grid changes at each plant; however, we show this data to illustrate a few concepts. First, the magnitude of difference in premiums between the plants is great. Tyson normally has a lower base price and higher premium structure than Farmland. Second, the differences in premiums become much greater at the heavier weights. Tyson provides incentives to market pigs at heavier weights than at Farmland. The data in Figure 2 shows the trend that was discussed earlier, where packers are providing greater discounts for lighter pigs. This data shows the impact of the grid change in 2005 at Farmland on total premium. Again this data illustrates two important points. First, the maximum achievable premium per load is \$1 to 1.50/cwt lower after the grid change. Second, the entire premium curve is shifted to the right, which has increased the optimal market weight for producers marketing to Farmland.

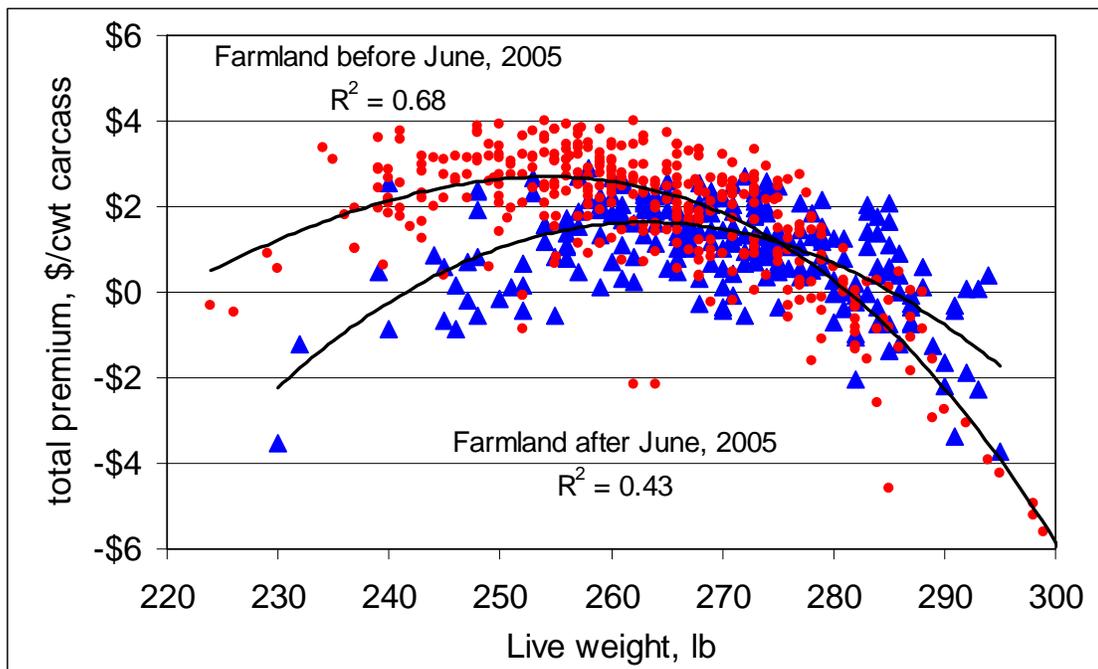


Figure 2. Influence of market weight on premium at Farmland before and after grid change in June, 2005.

So how does this data help determine the optimal market weight? After the regression parameters for the premium are fitted into the spreadsheet as discussed earlier, the optimal market weight will be predicted. Again, inputting data from the specific production system will improve the accuracy of the predictions; however, if you do not have the data available, predictions from other production systems are available as examples in the “KSU Market Weight Predictor” spreadsheet at www.KSUswine.org. Examples of the impact that market weight has on the optimal market weight at each packer are provided for Farmland (Figures 3 and 4), Tyson (Figures 5 and 6), and Triumph (Figures 7 and 8). Two curves are presented in each figure. The curve titled “Opportunity on tops” predicts the optimal market weight for any load of pigs that is removed from the barn before the barn must be closed out to make room for the next group of pigs. This curve calculates the margin over feed cost to predict the point at which any further increase in market weight will not pay for the cost of feed to gain that extra weight. The second curve titled “Opportunity for avg wt” should be considered the optimal average weight for all the pigs sold from the barn. This curve is based on

the margin over feed and facility costs. Thus, it predicts the point where the value of any additional weight will no longer cover the costs of the feed and facilities. If your production system does not have enough space to consistently achieve the optimal weight predicted by the “Opportunity for avg wt”, you need to explore opportunities to increase facility space to allow more days to market.

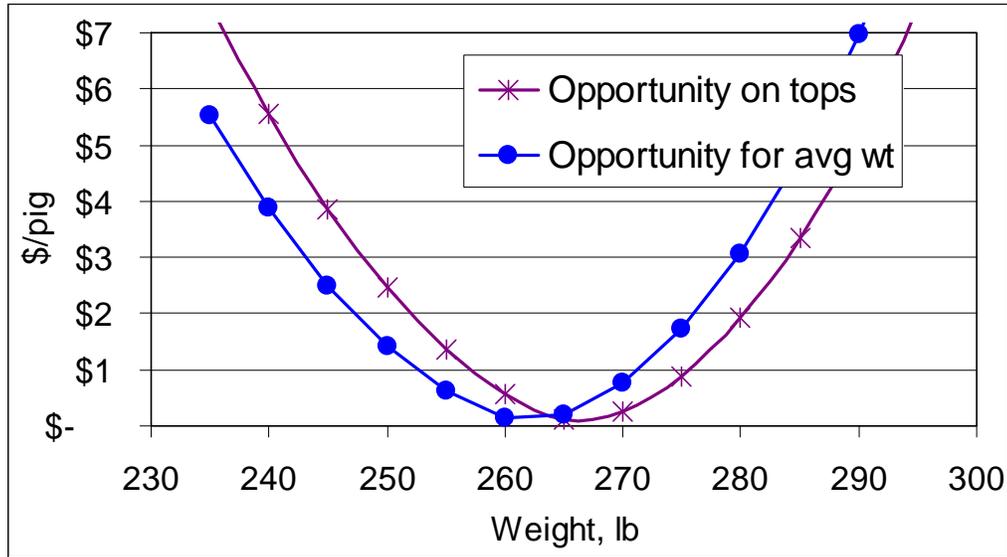


Figure 3. Optimal market weight at Farmland (\$50/cwt carcass price and \$200/ton final diet cost)

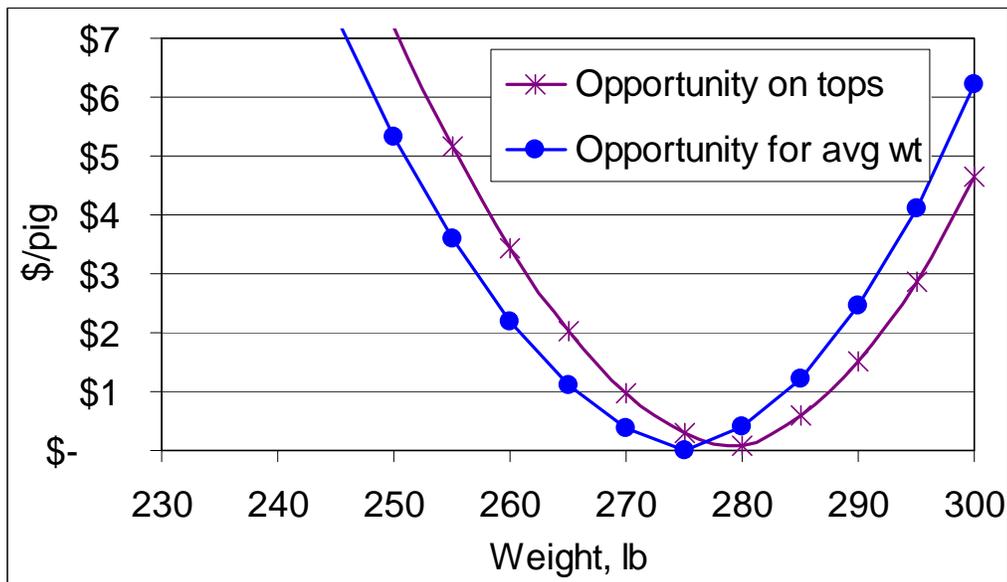


Figure 4. Optimal market weight at Farmland (\$75/cwt carcass price and \$200/ton final diet cost)

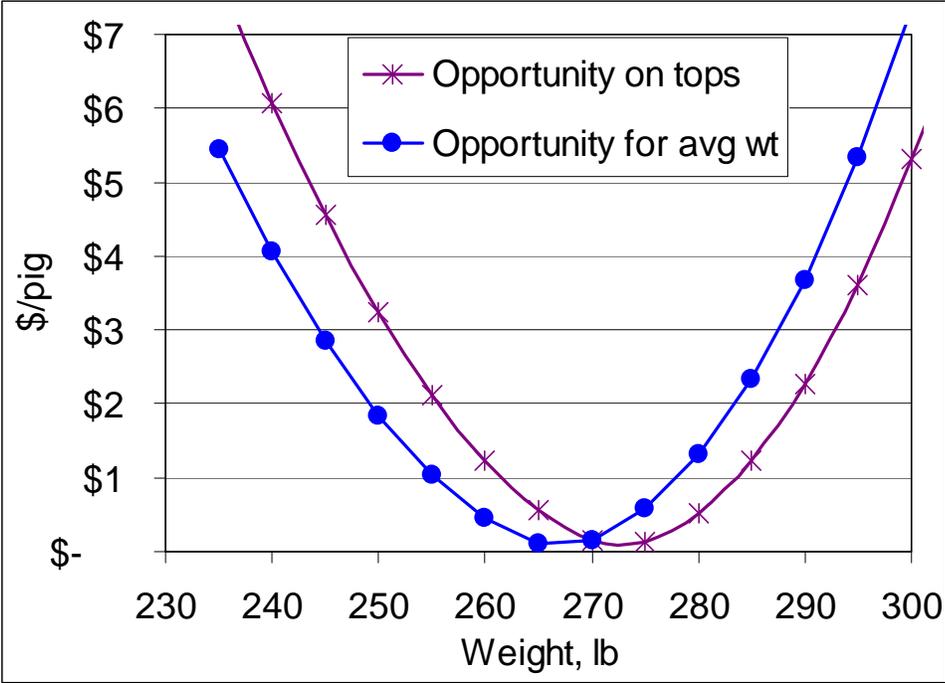


Figure 5. Optimal market weight at Tyson with \$50/cwt carcass price and \$200/ton final diet cost.

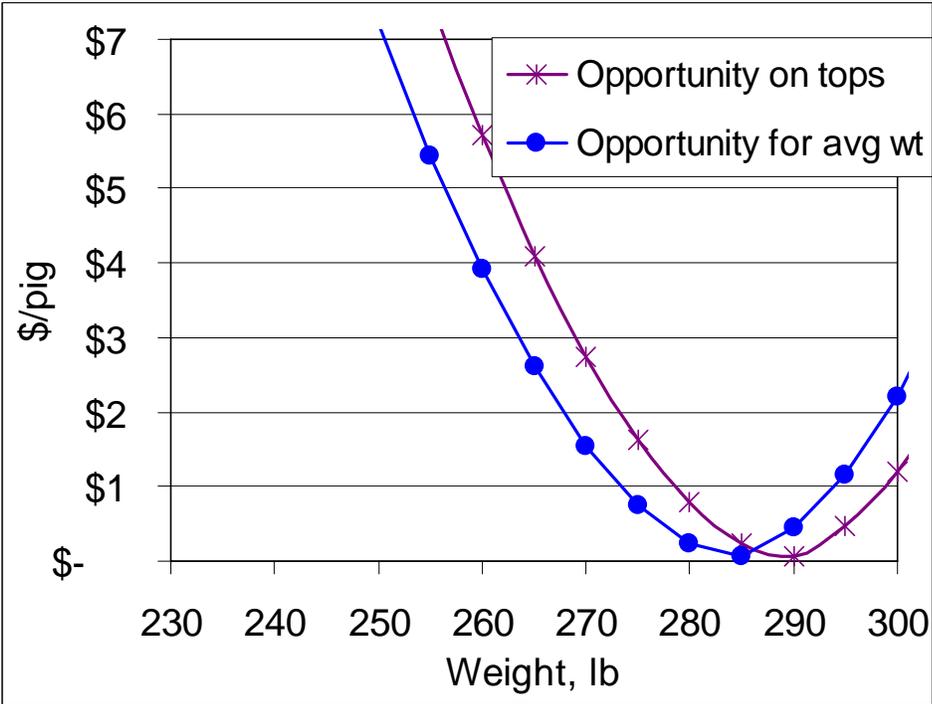


Figure 6. Optimal market weight at Tyson with \$50/cwt carcass price and \$200/ton final diet cost.

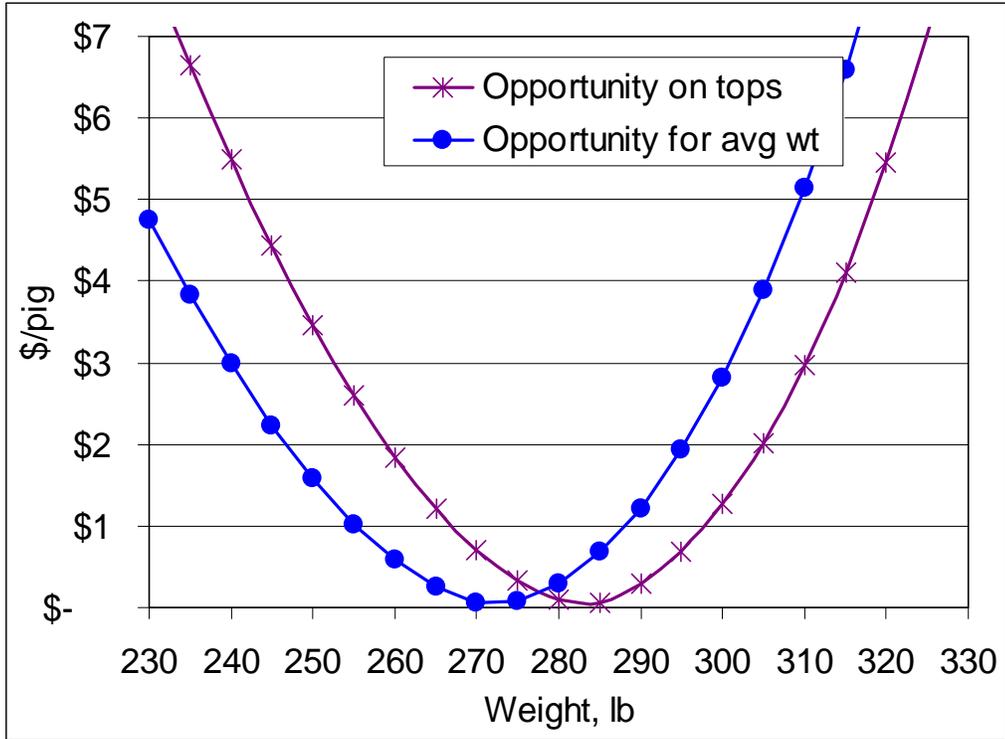


Figure 7. Optimal market weight at Triumph with \$50/cwt carcass price and \$200/ton final diet cost.

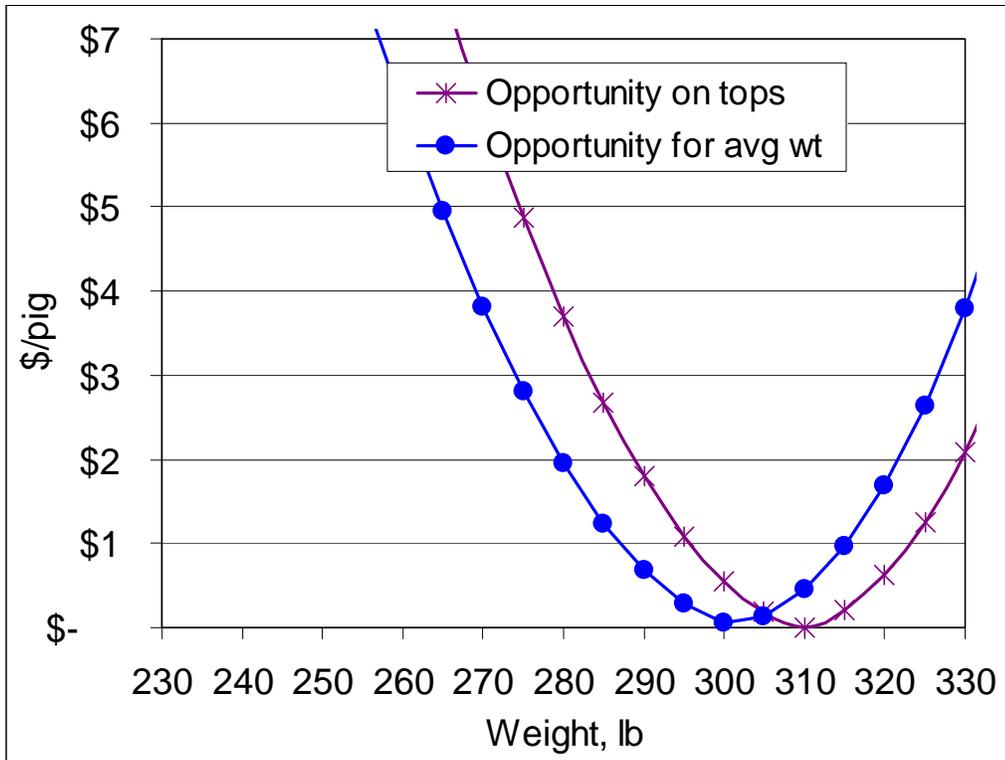


Figure 8. Optimal market weight at Triumph with \$75/cwt carcass price and \$200/ton final diet cost.

Another important concept to remember when viewing these figures is that they predict the optimal weight for a load of pigs and not for individual pigs. Optimal weights for individual pigs are almost always heavier than for the average of the load and will be covered in the next section. Also remember that because these figures represent the average of a load, any deviation from the optimal “opportunity cost” must be multiplied times the number of pigs in the load to predict the value that could have been gained by increasing or decreasing the weight of all the pigs on the load. Again, this data tells us nothing about your ability to sort and load the right pigs on the truck, but determines if the average weight of pigs was on target. As an example, if the first load of 170 pigs (tops) is marketed out of the barn to Farmland at 250 lb with a price of \$50/cwt carcass (Figure 3), the lost opportunity would be \$2.50/pig x 170 pigs or \$425 as compared with marketing the pigs at the optimal weight of 265 lb. When the market price is higher next summer (Figure 4), this lost opportunity escalates to \$7.19/pig or a total of \$1,222 for the 170-pig load as compared with the optimal weight, which will be 279 lb at the higher market price.

When comparing the three packers (Figures 3, 5, and 7), it is easily apparent that pigs sold to Tyson or Triumph should be marketed at a heavier weight than at Farmland. The optimal market weight, even with high feed cost (\$200/ton) and very low market price (\$50/cwt carcass or \$37.50/cwt live), is heavier at all three packers than many producers predict; 260 to 265 lb at Farmland, 265 to 275 lb at Tyson and 270 to 285 lb at Triumph. “Optimal” is that point where a producer achieves the most from the animals, the feed, the facilities and labor, successful “harvesting” tactics, if you will.

Although we may have high feed prices for some time, market prices will not remain this low. Current futures (as of January 21, 2008) project market hog prices will be \$73 to \$77/cwt through the summer and fall of 2008. Assuming feed prices remain constant at the \$200/ton, the impact of increasing hog price for each packer can be seen in Figures 4, 6, and 8. Increasing carcass base price from \$50 to \$75/cwt increases the optimal market weight by approximately 15 lb at Farmland, 20 lb at Tyson, and 25 lb at Triumph.

Major changes in diet cost will have a greater impact on the optimal weight for packers with a heavy desired market weight (Ex. Tyson and Triumph) than on lighter weight markets (ex. Farmland). The main reason is that feed efficiency becomes poorer at heavier weights and, thus, each incremental change in diet cost has a greater impact on feed cost/lb of gain at heavier weights than at lighter weights. A relatively large increase in diet cost (\$50/ton) will reduce the optimal market weight by about 7 or 8 lb at Farmland (Figure 9) with the change being similar at low and high market hog prices. For Tyson, the same increase in diet cost results in a 10 lb reduction in optimal market weight when pig prices are low (\$50/cwt carcass). The reduction in optimal market weight is less (6 to 7 lb) when pig prices are high (\$75/cwt). For Triumph, the optimal market weight is reduced by approximately 15 lb for each \$50/ton increase in diet cost.

Remember that all of the analysis discussed to this point is for loads of pigs. The ideal market weight for individual pigs is always heavier than the ideal market weight for the load. In the next section, we will discuss the ideal weight for individual pigs within the load.

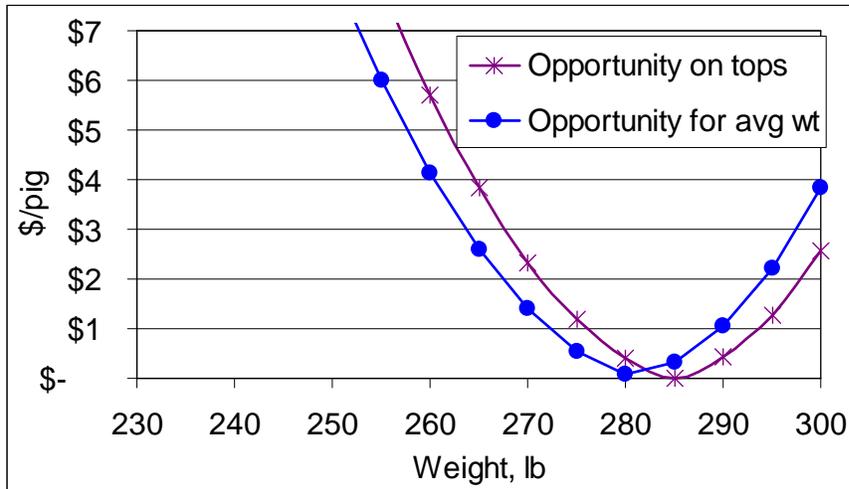


Figure 9. Optimal market weight at Farmland with \$75/cwt carcass price and \$150/ton final diet cost

Communicating results from individual loads.

A kill sheet report contains a lot of information. While it has been possible to study and extract valuable lessons from the printed copies, it has been most laborious and many times it just isn't done. The lessons learned are often hard to transmit back to the barns and the people loading the trucks. Because there is such a great impact of weight on value, getting the right pigs on the right trucks has immediate and substantial impact on revenues. The slaughter information, if it can be distilled down quickly and placed in the hands of barn managers, is a guide and incentive for diligence in loading each load.

Availability of the data, often within 24 hours over the Internet, led to the idea of a "Report Card" format that could be generated for each load. This report needed to be easy to understand and needed to be in the hands of those managing the loads while they could still remember the details that went into it. Presently we have built such Report Cards for the Triumph grid and the Tyson grid.

By copying the data for each load and each pig from the packer's web site, then pasting it into an Excel template, a one page summary is generated. The questions and signals that we believe are important and are captured in this report include:

- How many light and how many heavy pigs did I have on the load?
- What value was lost for pigs that were too heavy or too light?
- What "opportunity" was lost, considering the cost of the last diet and facility cost, for the light pigs on the load?
- What "penalty" occurred by marketing the heavy animals above the window?
- What impact does diet cost change the targeted market weight?
- What is occurring with lean premiums at each weight break with your pigs?

A color coded system shows pigs in the optimum weight range in green, pigs just below or just above the best fit in yellow, and the real outliers, both too light and too heavy in red. From the vantage point of the barn managers as they load the trucks this makes the explanation easy to share with all workers.

But the Report Card is not just for the people loading the trucks. Management and owners gain an appreciation for the "fit" of pig flow and facilities to the production of optimum weight pigs. Nearly all finisher barns are now operated on a "fixed time" basis with the absolute requirement that barns be

empty, cleaned and disinfected, then refilled according to a set schedule. The nursery must be emptied, the pigs must move so there is no real option to hold a slow-growing set of pigs an extra couple weeks. And while the “barn dump” concept has allure from a management standpoint, the cold reality is that present signals built into packer value grids make it a poor way to harvest maximal value.

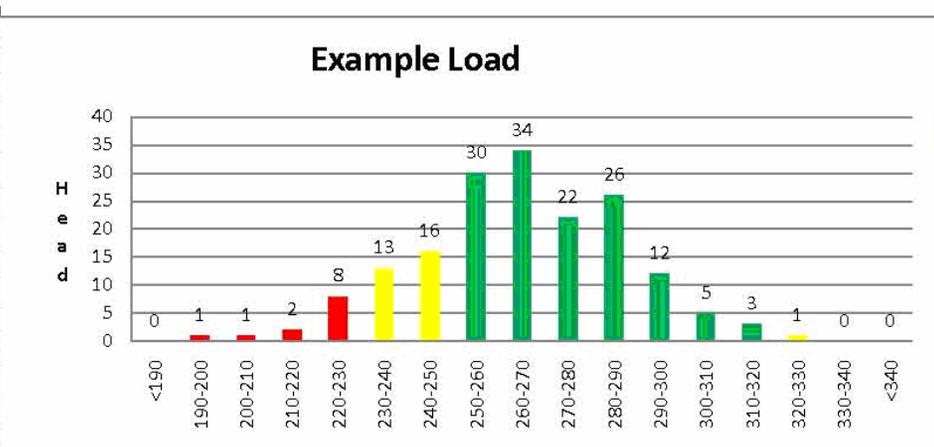
So what beneficial changes come from holding a report card from each load in your hands? Obviously, more disciplined selection and loading at the barn level, and a constant impetus for management to make system changes as needed. Some examples of benefits we hope producers are realizing from Report Cards include:

- Barns - Get the heavy pigs out of the barn on the first load! And this means that topping barns is an important step, even though it may require moving the truck to pick up a few pigs in that first cut. Even though the grids penalize light pigs more than heavies, those pigs that are over 340 lbs “fall off the cliff” in terms of penalty. So there has to be a keen eye for those few, but important, extreme animals – and they are in most groups.
- Barns - Hold lightest pigs to the last cleanout load for the barn. One of the first lessons from Report Cards was the surprising number of lighter pigs that made it onto the initial load from a barn. They should be on the last load!
- Management – “Grow days” count in achieving a targeted final weight. This means the importance of 21 day and older weaning, a full time schedule for nursery and enough days (and capacity) in finishing to allow grow days and the opportunity to make weight. Most barns were built to accommodate a market rewarding 255 lb pigs; today’s reality is that full value and best returns are at heavier weights that are nearing 300 lb. Most farms are not designed for today’s desired end-product. Most lack capacity for needed “grow days”.
- Management – Capacity to handle production is not very flexible in most systems and long-term planning increasingly looks like a required strategy. Pigs grow more slowly in hot weather so if the percentage of light-weight animals on the Report Card is a worry in February, realize it could be a full crisis in August. If provided with the same number of days, pigs will be approximately 15 lb lighter in the summer than in the winter. Plan ahead.
- Management – Understand where the best opportunities are for marketing lighter pigs. Better said, know where the pain and discounts are the least if there are no alternatives but to sell light.
- Management – Know when and to what extent Paylean or increasing dietary energy (fat) may or may not help in the summer. Work to nail the feed budget to avoid under-feeding lysine which greatly reduces daily gain.
- Management – When loading nurseries and finishers be sure to keep the age spread within a barn as narrow as possible to minimize variation when the barn has to empty. Wide age variation in a barn is difficult to market to best advantage.

In addition to the Report Card for individual loads, we compiled sets of specific loads into a “barn” to allow evaluation of the entire lot or barn of pigs. Each load from that facility is added to the others, and effectiveness of marketing the whole group can be studied and shared with the production team.

Success, even survival, in this swine industry is all about using every resource and about adaptability. Kansas producers have long shown the talent to use information and resourcefulness in recognizing and adjusting to change. Our K-State Swine Team keeps us focused on the reality and the bottom line; they are a resource and support we don’t acknowledge often enough. The coming months will demand attention to every detail and the discipline to capture maximum value and reduce costs. Report cards, feed budgets, diet review, and facility and pig flow review are steps that can make a huge difference and can minimize the pain of low markets and high input costs. Use these resources; our K-State Team responds and cooperates.

Example Load	
Kill Date:	12/19/07
Load ID:	21440-2-5544
Site Code:	Ex 123
Site Name:	Example
Carcass Base:	52.99
Paid Head:	174
Carcass Weight:	35,460.4
Avg. Carcass Weight:	203.8
Live Weight:	264.7
Est. Live Weight:	46,052.5
Yield percentage:	77%
Lean %:	52.2
Head not paid:	-
Lost ID animals	3



Last Diet Cost/T
\$ 190.00

Lost ID CWT value	52.92	Lean %	Fxd/hd	Lean\$/hd	Total \$	\$/Hd	\$/CWT	\$/CWT live
<190	0	-	-	-	-	-	-	-
190-200	1	52.8	(6.70)	1.26	62.46	62.46	41.92	32.28
200-210	1	49.0	(7.15)	(1.16)	64.13	64.13	40.33	31.06
210-220	2	50.4	(5.87)	(0.35)	156.96	78.48	47.14	36.29
220-230	8	53.7	(4.60)	2.63	717.06	89.63	51.85	39.92
230-240	13	52.1	(3.74)	1.17	1,215.11	93.47	51.58	39.71
240-250	16	54.1	(3.05)	3.29	1,598.79	99.92	53.12	40.90
250-260	30	52.4	(2.18)	1.63	3,108.99	103.63	52.71	40.59
260-270	34	52.4	(1.05)	1.54	3,689.09	108.50	53.23	40.99
270-280	22	51.2	(0.27)	0.41	2,472.45	112.38	53.06	40.85
280-290	26	52.2	0.49	1.61	3,081.37	118.51	53.95	41.54
290-300	12	51.5	1.36	0.77	1,464.38	122.03	53.84	41.45
300-310	5	51.7	2.32	1.22	630.95	126.19	53.97	41.56
310-320	3	50.3	3.48	(0.52)	375.04	125.01	51.23	39.45
320-330	1	51.3	3.55	0.79	128.90	128.90	51.77	39.86
330-340	0	-	-	-	-	-	-	-
<340	0	-	-	-	-	-	-	-
Load Totals/Average	174	52.3	(1.22)	1.47	18,765.68	107.85	52.92	40.75
Opportunity: revenue lost due to light pigs on this load:					\$721.66			
Opportunity: revenue lost due to heavy pigs on this load:					\$1.87			

TRIUMPH GRID REPORT CARD

RED light = Don't work at all

YELLOW light = should be on last load, barn cleanout

GREEN = Right On!

YELLOW heavy = should have been sooner

RED heavy = Oh, no!!!!

Figure 10 – A Good Load Example

Multi-load Barn Summary		Loads
Barn		21039-1-5538
Site Code:	Ex 123	21306-2-4864
Site Name:	Barn	21327-1-8564
Carcass Base:	53.48	21386-4-2893
Paid Head:	1,760	21386-3-3663
Carcass Weight:	378,592	21413-4-3595
Avg. Carcass Weight:	215	21413-3-1884
Live Weight:	278	21413-2-3166
Est. Live Weight:	489,392	21440-4-4724
Yield percentage:	77%	21440-2-5544
Lean %:	51.7	0
Head not paid:	5	0
Lost ID animals	118	
Lost ID CWT value	54.10	
<190	-	
190-200	1	
200-210	2	
210-220	9	
220-230	18	
230-240	44	
240-250	86	
250-260	175	
260-270	241	
270-280	375	
280-290	327	
290-300	225	
300-310	142	
310-320	80	
320-330	24	
330-340	9	
<340	2	
Load Totals/Average	1,760	

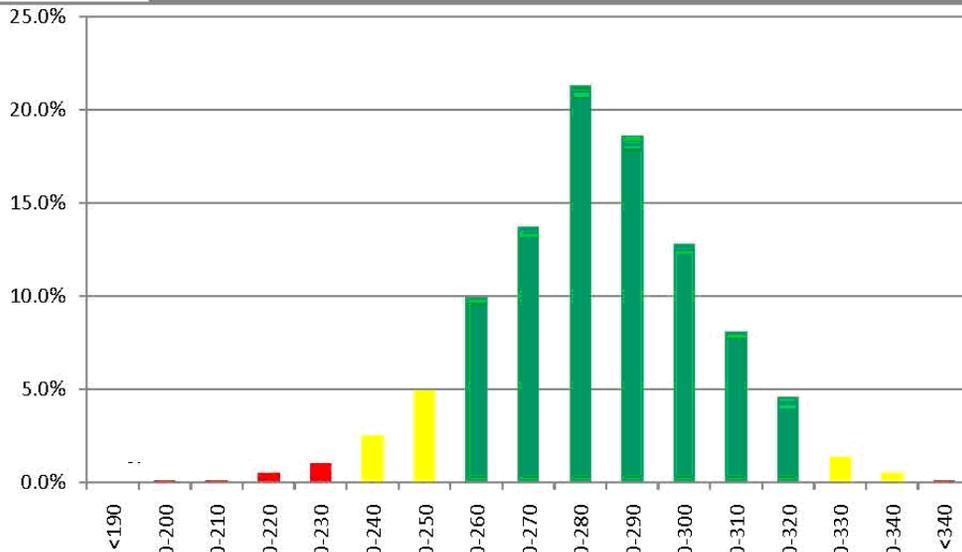
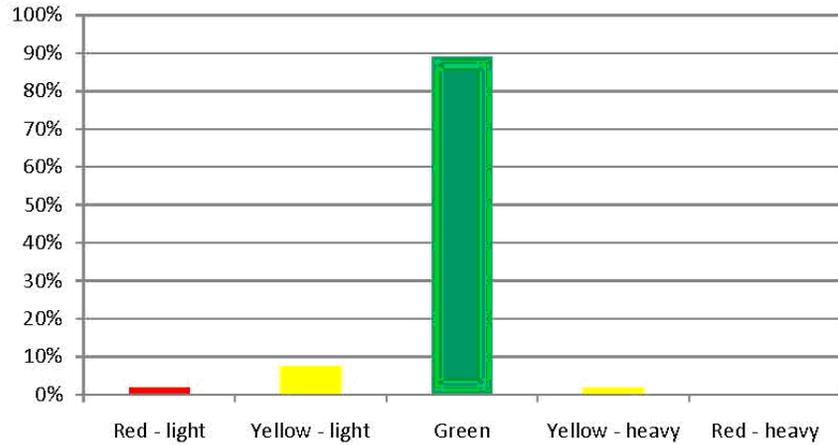
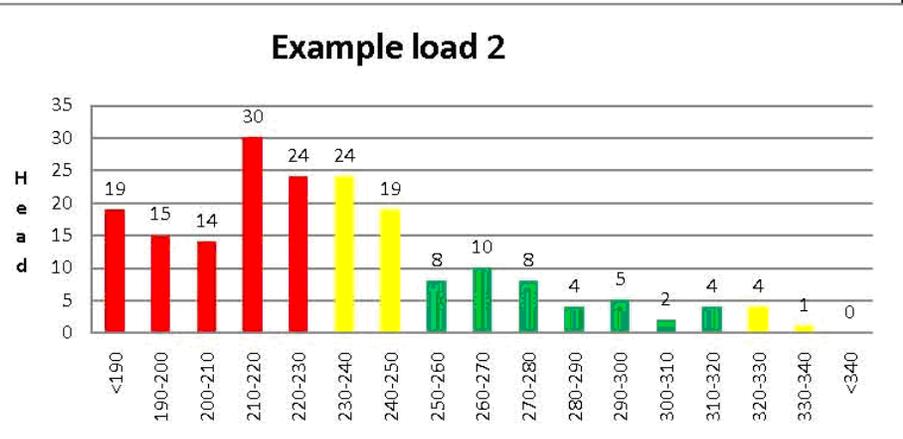


Figure 11 – Entire Barn Summary

Example load 2	
Kill Date:	1/7/08
Load ID:	218045
Site Code:	Ex 456
Site Name:	Ex load 2
Carcass Base:	51.31
Paid Head:	192
Carcass Weight:	34,299.0
Avg. Carcass Weight:	178.6
Live Weight:	232.0
Est. Live Weight:	44,544.2
Yield percentage:	77%
Lean %:	54.7
Head not paid:	1
Lost ID animals	4



Last Diet Cost/T
\$ 190.00

Lost ID CWT value	49.17	Lean %	Fxd/hd	Lean\$/hd	Total \$	\$/Hd	\$/CWT	\$/CWT live
<190	19	56.5	(6.18)	3.84	1,106.51	58.24	42.43	32.67
190-200	15	55.6	(6.78)	3.67	951.00	63.40	42.06	32.39
200-210	14	56.3	(6.59)	4.44	992.13	70.87	44.63	34.37
210-220	30	56.0	(5.83)	4.36	2,400.41	80.01	48.37	37.24
220-230	24	54.2	(4.61)	2.83	2,091.98	87.17	50.29	38.72
230-240	24	55.1	(3.41)	2.72	2,200.70	91.70	50.93	39.21
240-250	19	55.2	(3.14)	4.19	1,857.39	97.76	51.87	39.94
250-260	8	53.6	(2.33)	2.87	808.84	101.11	51.58	39.72
260-270	10	53.8	(1.16)	2.82	1,059.28	105.93	52.13	40.14
270-280	8	54.4	(0.15)	3.65	898.74	112.34	52.96	40.78
280-290	4	54.0	0.86	3.51	469.52	117.38	53.29	41.04
290-300	5	53.2	1.17	3.00	598.59	119.72	53.16	40.93
300-310	2	52.1	2.36	1.33	248.65	124.33	52.35	40.31
310-320	4	49.8	3.20	(2.07)	479.97	119.99	49.48	38.10
320-330	4	49.3	3.80	(2.89)	483.79	120.95	48.62	37.44
330-340	1	49.2	4.73	(1.86)	126.46	126.46	48.83	37.60
<340	0	-	-	-	-	-	-	-
Load Totals/Average	191	54.9	(3.79)	3.27	16,773.96	87.82	49.16	37.85
Opportunity: revenue lost due to light pigs on this load:					\$2,003.11			
Opportunity: revenue lost due to heavy pigs on this load:					\$14.29			

TRIUMPH GRID REPORT CARD

RED light = Don't work at all

YELLOW light = should be on last load, barn cleanout

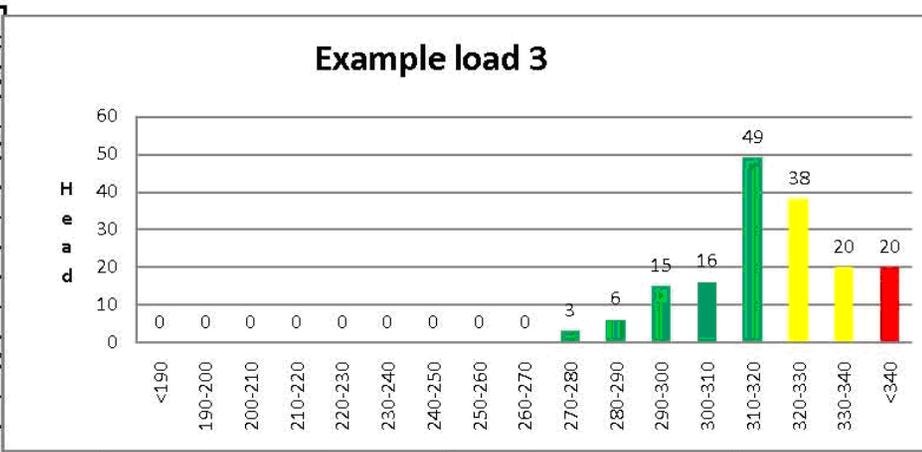
GREEN = Right On!

YELLOW heavy = should have been sooner

RED heavy = Oh, no!!!!

Figure 12 – A Light Load Example

Example load 3	
Kill Date:	11/12/07
Load ID:	218045
Site Code:	Ex 789
Site Name:	Ex load 3
Carcass Base:	54.68
Paid Head:	167
Carcass Weight:	41,091.2
Avg. Carcass Weight:	246.1
Live Weight:	319.6
Est. Live Weight:	53,365.2
Yield percentage:	77%
Lean %:	51.0
Head not paid:	-
Lost ID animals	2



Last Diet Cost/T
\$ 190.00

Lost ID CWT value	Lean %	Fxd/hd	Lean\$/hd	Total \$	\$/Hd	\$/CWT	\$/CWT live	
<190	0	-	-	-	-	-	-	
190-200	0	-	-	-	-	-	-	
200-210	0	-	-	-	-	-	-	
210-220	0	-	-	-	-	-	-	
220-230	0	-	-	-	-	-	-	
230-240	0	-	-	-	-	-	-	
240-250	0	-	-	-	-	-	-	
250-260	0	-	-	-	-	-	-	
260-270	0	-	-	-	-	-	-	
270-280	3	53.4	(0.39)	2.99	353.91	117.97	55.91	43.05
280-290	6	50.4	0.77	(0.69)	723.88	120.65	54.72	42.13
290-300	15	51.4	1.40	0.75	1,894.08	126.27	55.51	42.74
300-310	16	51.5	2.33	1.09	2,089.03	130.56	55.59	42.80
310-320	49	51.0	3.23	(0.09)	6,335.80	129.30	53.24	40.99
320-330	38	51.0	4.17	0.11	5,021.74	132.15	52.87	40.71
330-340	20	50.5	5.00	(0.39)	2,709.24	135.46	52.47	40.41
<340	20	50.8	6.35	(0.22)	2,608.61	130.43	48.29	37.18
Load Totals/Average	167	51.0	3.62	0.13	21,736.29	130.16	52.90	40.73
Opportunity: revenue lost due to light pigs on this load:								-\$16.38
Opportunity: revenue lost due to heavy pigs on this load:								\$603.82

TRIUMPH GRID REPORT CARD

RED light = Don't work at all

YELLOW light = should be on last load, barn cleanout

GREEN = Right On!

YELLOW heavy = should have been sooner

RED heavy = Oh, no!!!!

Figure 13 –A Heavy Load Example