

Dietary Energy Concentration Effects Financial Performance of Finishing Hogs

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A recent experiment was conducted at the University of Illinois (*Stein and Easter, 1996*) to examine the hypothesis that carcass leanness can be enhanced by diluting the dietary energy concentration of *ad libitum* fed finishing pigs.

One hundred and fifty PIC barrows were allotted to one of five treatment groups at approximately 54 kg. Five different energy levels were examined (Table 1). The lysine level of the diets were adjusted on an energy basis. All pigs were slaughtered at approximately 112 kg.

Table 1. Experimental diets.

| Diet # | Assumed Cost (\$/kg) | 1 | 2 | 3 | 4 | 5 |
|------------------------|----------------------|-------|-------|-------|-------|-------|
| Ingredients (%) | | | | | | |
| Corn | 0.177 | 67.85 | 75.9 | 62.5 | 49.4 | 36.15 |
| SBM (48%) | 0.275 | 24.4 | 22.0 | 17.5 | 12.9 | 8.4 |
| Fat | 0.375 | 5.5 | | | | |
| Wheat Bran | 0.165 | | | 10.0 | 20.0 | 30.0 |
| CGF | 0.143 | | | 5.0 | 10.0 | 15.0 |
| Alfalfa Meal | 0.145 | | | 3.0 | 6.0 | 9.0 |
| Vit&Mins | 0.750 | 2.25 | 2.1 | 2.0 | 1.7 | 1.45 |
| Cost (\$/kg) | | 0.225 | 0.211 | 0.202 | 0.192 | 0.182 |
| Nutrients | | | | | | |
| ME (Mcal/kg) | | 3.5 | 3.3 | 3.1 | 2.9 | 2.7 |
| T LYS (g/Mcal) | | 2.60 | 2.60 | 2.58 | 2.52 | 2.48 |
| D LYS (g/Mcal) | | 2.10 | 2.10 | 1.98 | 1.86 | 1.70 |

RESULTS

The results from the experiment are shown in Table 2. Tenth rib backfat decreased from 0.85 inches on the high energy diets to 0.70 inches on the low energy diets. There was no significant difference in LEA across treatments. Therefore, the calculated percent lean increase from approximately 50.5% to 52% from the high energy treatment to the low energy treatment. It is interesting to note that because of the lower ADG's of the low energy diets, average daily lean gain was significantly decreased with the lower energy diets.

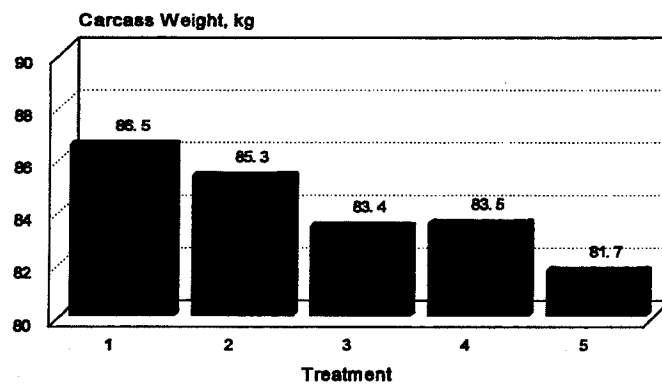
Table 2. Results from the growth experiment*

| Diet # | 1 | 2 | 3 | 4 | 5 |
|--------------------------|---------------------|--------------------|---------------------|--------------------|--------------------|
| Initial weight, kg | 53.9 | 54.7 | 54.4 | 53.6 | 54.1 |
| Final weight, kg | 113.8 | 113.9 | 111.8 | 112.9 | 111.2 |
| Average daily gain, g | 1017 ^a | 1038 ^a | 1006 ^{ab} | 931 ^{bc} | 872 ^c |
| Feed intake, kg/day | 2.91 ^a | 3.28 ^b | 3.36 ^b | 3.23 ^b | 3.31 ^b |
| Feed intake, mcal/day | 10.17 ^{ab} | 10.83 ^a | 10.41 ^a | 9.36 ^{bc} | 8.93 ^c |
| Gain:feed, kg/kg | 0.35 ^a | 0.32 ^b | 0.30 ^{bc} | 0.29 ^c | 0.26 ^d |
| Gain:feed, g/Mcal | 100 | 96 | 97 | 100 | 98 |
| Dressing, % | 75.97 ^a | 74.9 ^{ab} | 74.56 ^{bc} | 73.96 ^c | 73.51 ^c |
| 10th Rib fat, in. | 0.85 ^a | 0.86 ^a | 0.78 ^{ab} | 0.70 ^b | 0.69 ^b |
| Loin Eye Area, in. | 5.71 | 5.57 | 5.68 | 5.62 | 5.34 |
| Carcass lean, % | 50.78 ^{ab} | 50.42 ^b | 51.72 ^{ab} | 52.32 ^a | 52.0 ^{ab} |
| Avg. Daily lean gain, g | 392 ^a | 382 ^{ab} | 386 ^{ab} | 358 ^{bc} | 330 ^c |
| Tot. Lysine Intake (g/d) | 26 | 28 | 27 | 24 | 22 |
| Dig. Lysine Intake (g/d) | 21 | 23 | 21 | 17 | 15 |

*Values with different superscripts are significantly different (P<0.05)

The carcass yield was also significantly influenced by energy concentration (Figure 1). Therefore, the question becomes - does the increase in percent lean pay for the loss in carcass weight?

Figure 1. Effect of Energy Density on Carcass Weight



Financial Performance

In order to calculate the financial performance, assumptions must be made:

- 14 open days per rotation
- 54 kg barrow is worth US\$65.00
- variable costs are US\$8.00/pig
- pork price is US\$1.00/kg live weight for US
- pork price is US\$1.25/kg carcass weight for Canada
- live weight adjusted to 113.8 kg.

Table 3. Calculated costs from 54-112 kg

| Treatment | 1 | 2 | 3 | 4 | 5 |
|-----------------------|--------|--------|--------|--------|--------|
| Days to market | 59 | 57 | 57 | 64 | 65 |
| Extra days to 113.8kg | 0 | 0 | 2 | 1 | 3 |
| Total days | 59 | 57 | 59 | 65 | 68 |
| Feed cost, \$/pig | 38.51 | 39.04 | 40.01 | 39.87 | 41.82 |
| Initial cost, \$/pig | 65.00 | 65.00 | 65.00 | 65.00 | 65.00 |
| Variable cost, \$/pig | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 |
| Total cost, \$/pig | 111.51 | 112.04 | 113.01 | 112.87 | 114.81 |

Table 4 shows the financial performance by treatment using the Alberta hog carcass grading/settlement grid (Alberta Pork Producers Development Corporation, November 1, 1995). Calculated carcass lean values and dressing percents from Table 2 were used in the grid.

Table 4. Financial performance using the Alberta grid

| Treatment | 1 | 2 | 3 | 4 | 5 |
|-----------------------|--------|--------|--------|--------|--------|
| Carcass Index | 111.0 | 111.0 | 112.0 | 113.0 | 113.0 |
| Carcass value, \$/pig | 119.95 | 118.27 | 118.89 | 118.89 | 118.16 |
| Profit/pig, \$ | 8.44 | 6.22 | 5.88 | 6.02 | 3.35 |
| Rotations | 5.00 | 5.14 | 5.00 | 4.62 | 4.45 |
| Profit/Place/Year, \$ | 42.22 | 32.00 | 29.40 | 27.81 | 14.91 |

Table 5 shows the financial performance by treatment using a leading US packer's hog carcass grading/settlement grid. Measured backfat and dressing percents from Table 2 were used in the grid. Carcass weight was adjusted to live weight using a standardized dressing percent of 75.5%.

Table 5. Financial performance using the a leading US packer's grid

| Treatment | 1 | 2 | 3 | 4 | 5 |
|-----------------------|--------|--------|--------|--------|--------|
| Carcass Index | 105.6 | 105.6 | 106.0 | 108.0 | 108.0 |
| Carcass value, \$/pig | 120.92 | 119.22 | 119.13 | 120.40 | 119.66 |
| Profit/pig, \$ | 9.41 | 7.18 | 6.12 | 7.53 | 4.85 |
| Rotations | 5.00 | 5.14 | 5.00 | 4.62 | 4.45 |
| Profit/Place/Year, \$ | 47.05 | 36.91 | 30.60 | 34.79 | 21.58 |

Conclusion

The financial performance using two different grids show that higher energy diets are more economical to feed than lower energy diets. The financial performance analyses used here are just for reference and should not be compared to each other. You should do the same type of analysis using your cost and return figures. It should also be noted that these calculations were done on average treatment values and the variation within treatments were not considered.

Reviewed Manuscript

Stein, H. And R.A.Easter. 1996. Dietary Energy Concentration Effects Carcass Leanness in Finishing Hogs. 1996 University of Illinois Swine Research Reports pp. 41-47.