Swine Update

Kansas State University Agricultural Experiment Station
and Cooperative Extension Service

Animal Sciences & Industry

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KANSAS STATE UNIVERSITY SWINE PROFITABILITY CONFERENCE

Tuesday, February 2, 1999
Forum Hall—K-State Union

Morning Program

9:15 COFFEE AND DONUTS

9:30 *Key Decisions For Your Pork Business In The Next Millennium*
Glen Grimes—Leading Swine Economist, University of Missouri

10:30 *The Challenge To Maintain Competitiveness During Consolidation*
Mike Tokach, Extension Swine Specialist, Kansas State University

11:15 *Restructuring Of My Swine Business To Meet New Challenges*
Ken Goodyear, Swine Producer, Dwight, Kansas

12:00 LUNCH—K-State Main Ballroom

Afternoon Program

1:15 *What Have We Learned From The NPPC Lean Growth Study—Including Pork Quality*
Rodger Johnson—Swine Genetics, University of Nebraska

2:15 Special Lecture: Jack and Pat Anderson Lecture in Swine Health Management:
Optimizing Growing–Finishing Production, co-sponsored by American Association of Swine Practitioners
Paul Yeske—Consulting Swine Practitioner, Nicollet, Minnesota

3:00 ADJOURN

Registration Deadline:

January 28th, 1999
Registration fee is $25 per person
Please send your name, address, number of people attending to:
Jim Nelssen
243 Weber Hall
Department of Animal Sciences and Industry
Kansas State University
Manhattan, KS 66506–0201
Attn. Swine Profitability Conference

Your check for $25 per person and made out to the KSU Swine Profitability Conference must be included.

Added Dietary Fat Improves Growth Performance and Feed Efficiency in Growing–Finishing Pigs Under Commercial Conditions

Several experiments have been conducted to determine the influence of fat additions to growing–finishing diets on pig performance and carcass composition. In general, for every 1% added dietary fat, average daily gain is expected to increase 1% and feed efficiency is expected to improve 2%. However, several questions arise with this simplistic rule of thumb. First, is the response to added fat the same at all levels of addition (i.e., is the response from increasing dietary fat from 0 to 2% the same as increasing fat from 4 to 6%)? Second, is the response the same for all phases during growing–finishing? Because pigs are more energy deficient in the early finisher period, we would expect a greater response during this period. Third, recent trials in university research settings demonstrate a much smaller response to fat additions to grain–soybean meal diets than those in the rule of thumb presented above. This is likely because feed intake is normally 25 to 40% higher in university research settings than under field conditions. Therefore, the objective of this research was to determine the influence of graded levels of added fat on carcass composition and growth performance of growing–finishing pigs in a research facility closely approximating field conditions.

Procedures: The experiment was conducted in a commercial research unit holding 24 pens with 20 pigs per pen. Pigs (PIC) were allotted randomly to pens each having an initial average pig weight of 80 lb. There were 12 pens of barrows and 12 pens of gilts (3 pens of each sex per treatment). Pens had totally slatted floors and provided 7.2 sq ft per pig. The four dietary treatments were based on level of added dietary fat (0, 2, 4, or 6%). Diets were fed in three phases with the lysine:calorie ratio decreasing with each phase (Table 1).

Results and Discussion: During phase 1 (80 to 130 lb), ADG and F/G improved linearly (P<.05) as dietary fat increased from 0 to 6% (Table 2). Average daily feed intake was not influenced by fat additions. During phase 2 (130 to 210 lb), the response in ADG was not as great (linear, P<.13); however, the response in F/G (linear, P<.05) was similar. During phase 3 (210 to 265 lb), ADFI and F/G decreased linearly (P<.05) as fat was added to the diet. Added dietary fat did not influence ADG. For the overall period, ADG and F/G improved linearly (P<.05) as additional fat was added to the diet. A trend for lower ADFI (P<.13) also occurred as dietary fat increased.

Carcass data were analyzed without and with adjustment for a common carcass weight. When the data were not adjusted for the increased weight gain for pigs fed the diets with added fat (data not shown), carcass weight, backfat, and sort loss increased linearly (P<.05). Lean percentage and premium per pig decreased linearly (P<.05) with increasing dietary fat. After the data were adjusted to a common market weight (Table 3), no differences occurred in any of the carcass or sale price parameters. These data demonstrate the importance of adjusting the data to a common market weight to demonstrate the true treatment effects. Under the circumstances of this trial, fat level of up to 6% can be added to corn–soybean meal-based diets for growing–finishing pigs without negatively influencing standard carcass parameters or premiums received.

For a more complete understanding of the change in growth response from one phase to the next, the influence of added fat on pig performance is listed as the percentage improvement over the control diet in Table 4. The influence of fat level on ADG was greater (1.5% for every 1% fat) and more consistent during phase 1 than during subsequent phases. Overall, addition of each 1% fat resulted in approximately a 1% increase in ADG. The negative influence of added fat on ADFI became greater as the trial progressed, with approximately 1% reduction in ADFI for every 1% added fat. The most consistent response to dietary fat was the improvement in F/G. Every 1% addition of fat resulted in approximately 2% improvement in F/G, and the response was consistent for each further addition of fat to the diet.

Using the economic scenario presented in Table 2, adding fat to the diet will not consistently reduce feed cost per pound of gain. Any economic calculations, however, also must include the impact of the improvement in ADG. The value of the extra gain will depend on the availability of growing–finishing space. For systems that have excess space or can easily contract additional space, the advantage in ADG is worth only the reduced number of days in the facility. For example, adding 6% fat to the diet during phases 1 and 2 reduces the number of days needed to grow from 80 to 210 lb from 78 to 73 d. If the space is worth only $.10/day, the extra gain is worth only $.50 per pig. For systems with limited space (i.e., systems with difficulty reaching the desired market weight), the advantage in ADG is worth the extra pounds sold at market. In this example, adding 6% fat to the diet during phases 1 and 2 increases the weight per pig by 8.6 lb (130 vs. 138.6 lb gain) with the same number of days. If market price was $40/cwt, the extra weight would be worth an additional $3.44. Therefore, the economics of whether fat should be added to the growing–finishing diet depend on the design of the production system as well as the prices of corn, soybean meal, and fat.

Table 1. Lysine to Calorie Ratio (g lys/Mcal ME) and Lysine Level for Each Diet

			Added Dietary Fat, %			
Phase	Weight	Lysine: ME	0	2	4	6
1	80 to 130	3.67	1.21	1.24	1.27	1.30
2	130 to 205	2.67	.875	.90	.925	.95
3	205 to market	1.97	.655	.67	.685	.70

Table 2. Influence of Level of Added Dietary Fat on Pig Performance and Feed Cost

Item	Added Dietary Fat, %				CV
	0	2	4	6	
Phase 1 (80 to 130 lb)					
ADG, lb[a]	1.79	1.83	1.89	1.97	4.5
ADFI, lb	4.12	4.02	4.00	3.99	6.9
F/G[a]	2.30	2.20	2.12	2.02	4.6
Feed cost, $/lb[c]	.164	.164	.165	.163	
Phase 2 (130 to 210 lb)					
ADG, lb[b]	1.59	1.58	1.67	1.67	6.6
ADFI, lb	4.83	4.68	4.71	4.56	8.5
F/G[a]	3.04	2.97	2.81	2.72	4.6
Feed cost, $/lb[c]	.207	.211	.209	.210	
Phase 3 (210 to 265 lb)					
ADG, lb	1.54	1.54	1.62	1.58	6.1
ADFI, lb[a]	5.64	5.45	5.49	5.15	5.9
F/G[a]	3.67	3.53	3.38	3.25	4.4
Feed cost, $/lb[c]	.217	.220	.222	.224	
Overall					
ADG, lb[a]	1.63	1.63	1.72	1.72	4.0
ADFI, lb[b]	4.87	4.72	4.75	4.58	6.3
F/G[a]	2.99	2.88	2.76	2.65	3.7

[a] Linear effect of added fat (P<.05). [b]Linear effect of added fat (P< .13).
[c] Prices used to figure cost per lb of gain include $2.50/bu corn, $200/ton SBM, and $.19/lb fat.

Table 3. Influence of Level of Added Dietary Fat on Carcass Parameters and Market Price

Item	Added Dietary Fat, %				CV
	0	2	4	6	
Adjusted to common carcass weight (196.6 lb)[a]					
Backfat, in	.68	.73	.65	.73	5.8
Loin depth, in	2.29	2.32	2.29	2.27	2.7
Lean, %	55.2	54.6	55.6	54.5	1.2
Live price, $/cwt	56.84	56.70	57.37	57.94	3.2
Premium, $/cwt	4.38	3.87	4.54	3.81	10.4
Sort, $/cwt	.39	.45	.59	.61	56.4

[a] No Significant differences when adjusted to a common carcass weight.

Table 4. Influence of Added Dietary Fat on Percentage Response in Pig Performance

Item	Added Dietary Fat, %				Response per 1% Fat
	0	2	4	6	
Average daily gain					
Phase 1 (80 to 130 lb)	0	2.2%	5.5%	10.1%	1.5%
Phase 2 (130 to 210 lb)	0	–0.9%	5.2%	4.9%	0.8%
Phase 3 (210 to 265 lb)	0	0.4%	5.5%	2.7%	0.6%
Overall	0	0.4%	5.3%	5.7%	0.83%
Average daily feed intake					
Phase 1 (80 to 130 lb)	0	–2.2%	–2.7%	–3.1%	–0.8%
Phase 2 (130 to 210 lb)	0	–3.2%	–2.4%	–5.8%	–1.1%
Phase 3 (210 to 265 lb)	0	–3.4%	–2.8%	–8.7%	–1.3%
Overall	0	–3.1%	–2.5%	–6.1%	–1.1%
Feed efficiency					
Phase 1 (80 to 130 lb)	0	–4.3%	–7.8%	–12.0%	–2.0%
Phase 2 (130 to 210 lb)	0	–2.5%	–7.5%	–10.5%	–1.6%
Phase 3 (210 to 265 lb)	0	–3.7%	–7.9%	–11.2%	–1.9%
Overall	0	–3.5%	–7.6%	–11.3%	–1.84%

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SWINE UPDATE

UPCOMING EVENTS

Kansas State University

Swine Profitability Conference

February 2, 1999

(see page 1 for more details)

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