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Influence of Fat Level and Calorie:Protein
Ratio on Performance and Carcass Composition
of Young Pigs

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Summary

One hundred forty pigs averaging 28 pounds were fed a corn-soybean meal diet to study the influence of fat level and calorie:protein (C:P) ratio on the performance and carcass composition. With a constant C:P ratio, fat level made no significant difference on daily gains, but feed efficiency improved as fat level increased. Increasing fat without adjusting the C:P ratio decreased daily gain and metabolizable energy per unit of gain increased. With a constant C:P ratio, feeding 6 or 12% fat did not influence fat content of the carcass. However, feeding 12% added fat without adjusting the C:P ratio markedly increased fat content of the carcass.

Procedures

One hundred forty pigs averaging 28 pounds were randomly assigned to diets containing 0,3,6,9,12, or 15% added fat¹ with a constant C:P ratio and 6,9,12, or 15% added fat without adjusting the C:P ratio. The pigs were in an environmentally controlled, slatted-floor nursery with 7 pigs per pen. Composition of the diets are shown in table 23. The basal diet contained 17.1% crude protein, 0.96% calcium, and 0.81% phosphorus. After the 28-day feeding trial, four pigs were selected for carcass analysis from each of these treatments: (1) 0% added fat, (2) 6% added fat with a constant C:P ratio, (3) 12% added fat with a constant C:P ratio, (4) 12% added fat without adjusting the C:P ratio. Specific gravity was determined on the right side of each carcass. The entire right side of each carcass was ground, thoroughly mixed, reground and mixed (twice) before samples were taken for determination of dry matter, protein, and fat content.

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Results and Discussion

Influences of fat level and calorie:protein ratio on the performance of young pigs are shown in table 24. Pigs fed diets containing 0,3,6,9,12, or 15% added fat with a constant C:P ratio made similar daily gains. With a constant C:P ratio feed efficiency improved as fat in the diet increased. As fat increased without adjusting the C:P ratio daily gain decreased and metabolizable energy per unit of gain increased.

The influence of fat level and C:P ratio on carcass composition is presented in table 25. With a constant C:P ratio; 6 or 12% added fat did not significantly affect carcass protein or fat. However, 12% added fat without adjusting the C:P ratio significantly ($P < .05$) increased carcass fat content and decreased protein content.

Data from this study confirm and extend previous work here (Swine Industry Day 1971) in demonstrating the importance of increasing protein level when fat is added to a diet. The present study demonstrates that 12% fat may be added to the diet of the young pig without influencing carcass composition.

Table 23. Composition of Diets (Percentage)

	0	3	6	9	12	15	6	9	12	15
Fat level, %										
C:P ratio	19.2	19.2	19.2	19.2	19.2	19.2	21.5	22.6	23.8	24.9
Ingredients										
Gr. yellow corn	61.4	55.8	50.2	45.1	39.9	34.3	55.4	52.4	49.4	46.4
Rolled oat groats	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Soybean meal (44%)	24.0	26.6	29.2	31.3	33.5	36.1	24.0	24.0	24.0	24.0
Fat	----	3.0	6.0	9.0	12.0	15.0	6.0	9.0	12.0	15.0
Dicalcium phosphate	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Limestone	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Salt	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Vitamin, antibiotic and trace mineral premix	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

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Table 24. Influence of Fat Level and Calorie:Protein Ratio on Performance of Young Pigs

Added fat, % C:P ratio	0 19.2	3 19.2	6 19.2	9 19.2	12 19.2	15 19.2	6 21.5	9 22.6	12 23.8	15 24.9
Daily gain, lb.	1.26 ^{ab}	1.34 ^a	1.33 ^a	1.36 ^a	1.33 ^a	1.26 ^{ab}	1.27 ^{ab}	1.20 ^b	1.17 ^b	1.04 ^c
Daily feed intake, lb.	2.40	2.31 ^{abcd}	2.35 ^{cde}	2.32 ^{de}	2.04 ^e	1.91 ^e	2.54 ^{ab}	2.56 ^a	2.17 ^{bde}	2.03 ^{abc}
Feed/gain	1.90	1.73	1.76	1.70	1.54	1.51	2.00	2.13	1.85	1.95
Metabolizable energy consumed daily, Kcal	3571	3607	3793	3879	3509	3390	4141	4315	3793	3664
Kcal metabolizable energy/lb. gain	2828	2701	2845	2853	2649	2685	3262	3606	3204	3529

a,b,c,d,e

Means on the same line with different superscripts differ significantly (P<.05).

Table 25. Effect of Fat Level and Calorie:Protein Ratio on Carcass Composition

Added fat, % C:P ratio	0 19.2	6 19.2	12 19.2	12 23.8
Dry matter, %	37.31 ^a	36.06 ^a	37.56 ^a	40.18 ^b
Fat, %	18.62 ^a	17.19 ^a	19.36 ^a	23.27 ^b
Crude protein, %	16.73 ^a	16.62 ^a	16.46 ^a	14.91 ^b
Specific gravity	1.0615	1.0596	1.0553	1.0507

a,b

Means on the same line with different superscripts differ significantly (P<.05).