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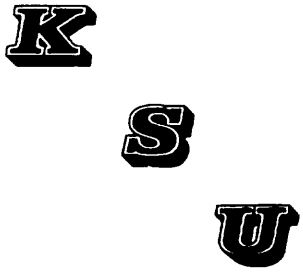
Abstract

One hundred twenty-eight pigs averaging 44 pounds were used to determine the influence of level of dietary fat and calorie:protein ratio on the performance of young pigs. Daily gains by pigs fed diets containing 0, 3, 6, 9, or 12% added fat did not differ significantly. Feed efficiency and kcal metabolizable energy per pound of gain were improved as the fat level of the diet increased. When fat was added to the diet without adjusting the calorie: protein ratio, average daily gain and energy efficiency were significantly reduced. Thus, suggesting the importance of the. calorie:protein ratio in the nutrition of young pigs. Current prices make fat an economical source of energy for young pigs.; Swine Day, Manhattan, KS, October 7, 1971

Keywords

Swine day, 1971; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 181; Swine; Fat; Calorie:Protein ratio; Performance; Young pigs



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

G. L. Allee and R. H. Hines

Summary

One hundred twenty-eight pigs averaging 44 pounds were used to determine the influence of level of dietary fat and calorie:protein ratio on the performance of young pigs. Daily gains by pigs fed diets containing 0, 3, 6, 9, or 12% added fat did not differ significantly. Feed efficiency and kcal metabolizable energy per pound of gain were improved as the fat level of the diet increased. When fat was added to the diet without adjusting the calorie: protein ratio, average daily gain and energy efficiency were significantly reduced. Thus, suggesting the importance of the calorie:protein ratio in the nutrition of young pigs. Current prices make fat an economical source of energy for young pigs.

Procedures

One hundred twenty-eight pigs averaging 44 pounds were randomly assigned to treatments consisting of feeding fat[1] levels of 0, 3, 6, 9, 12% added to diets and maintaining a constant calorie:protein ratio, or feeding 6, 9, or 12% added fat without adjusting the calorie:protein ratio. The study was conducted in an environmentally controlled nursery with slatted floors, eight pigs per pen. Composition of the experimental diets are shown in table 11. The basal diet contained 17.1% crude protein, 0.96% calcium, and 0.81% phosphorus. The trial lasted 28 days.

Results and Discussion

The influence of fat level and calorie:protein ratio on the performance of young pigs is shown in table 12. Pigs fed diets containing 0, 3, 6, 9, or 12% added fat made similar daily gains. Average daily feed intake decreased as fat level increased. Feed efficiency improved as fat in the diet increased.

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[1] HEF, Proctor and Gamble Company, Cincinnati, Ohio

Addition of fat to diets increases the caloric density and therefore usually decreases feed intake. Hence, if fat replaces an equivalent amount of carbohydrate in a diet already deficient or marginal in protein or an amino acid, a reduction in voluntary food intake would be anticipated. When this occurs, single or multiple amino acid deficiency rather than fat addition per se is the cause of the depression in gain and energy efficiency.

Data from this study demonstrates the importance of increasing the protein level when fat is added to a diet. For example, pigs fed a diet containing 9% added fat without adjusting the protein level of the diet gained significantly ($P < .05$) slower and required significantly ($P < .05$) more feed per pound of gain than pigs fed a diet containing 9% added fat where the protein level was increased to maintain a constant calorie:protein ratio.

Based on current prices, feed cost per pound of gain was reduced as increasing amounts of fat were added to the basal diet.

Table 11. Composition of diets (percent)

Fat level, %	0	3	6	9	12	6	9	12
Calorie:protein ratio	19.2	19.2	19.2	19.2	19.2	21.5	22.6	23.8
Ingredients								
Gr. yellow corn	61.4	55.8	50.2	45.1	39.9	55.4	52.4	49.4
Rolled oat groats	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	24.0	24.0	24.0
Fat[1]	--	3.0	6.0	9.0	12.0	6.0	9.0	12.0
Dicalcium phosphate	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
Salt	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]HEF Proctor and Gamble Company, Cincinnati, Ohio

Table 12. Influence of Level of Dietary Fat and Calorie:Protein Ratio on Performance of Young Pigs

Fat level, %	0	3	6	9	12	6	9	12
Calorie:protein ratio	19.2	19.2	19.2	19.2	19.2	21.5	22.6	23.8
No. of pigs	16	16	16	16	16	16	16	16
Avg. initial wt., lbs.	43.7	45.3	45.0	44.1	43.6	43.6	43.7	42.4
Avg. daily gain, lbs.	1.48[a]	1.44[ab]	1.50[a]	1.52[a]	1.52[a]	1.41[ab]	1.36[b]	1.32[b]
Avg. daily feed, lbs.	3.68	3.25	3.16	2.86	2.86	3.16	2.98	2.97
Feed/lb. gain	2.49[a]	2.26[b]	2.10[b]	1.89[c]	1.88[c]	2.24[b]	2.19[b]	2.25[b]
Kcal metabolizable energy/lb. gain	3708	3527	3397	3174	3224	3639	3699	3956
Feed cost/lb. gain, cents	9.64	9.22	8.99	8.45	8.76	9.39	9.50	10.12

[a,b,c] Means on the same line bearing different superscripts are significantly ($P < .05$) different.

Based on the following prices: Fat 8¢/lb; corn 2.79¢/lb; rolled oat groats 5.20¢/lb; soybean meal 4.55¢/lb; vitamin, trace mineral and antibiotic premix 35¢/lb. and grinding, mixing and pelleting 2¢/lb.