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Abstract

We used 96 crossbred pigs averaging 8.3 kg (19.3 lbs.) to compare performances with sorghum, corn, or wheat with 0 or 4% added fat (tallow). The trial ended when pigs averaged approximately 220 pounds. Grain source (sorghum, corn, or wheat) did not affect average daily gain or feed efficiency of pigs during any ration phase (starter, grower, or finisher). Adding fat (to each grain ration) reduced feed intake and improved feed efficiency during each ration phase. The greatest improvement in feed efficiency from added fat was during the finishing phase.; Swine Day, Manhattan, KS, November 9, 1978

Keywords

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Performance of Pigs Fed Corn, Sorghum, or Wheat With 0 or 4% Added Fat

Gary L. Allee

Summary

We used 96 crossbred pigs averaging 8.3 kg (19.3 lbs.) to compare performances with sorghum, corn, or wheat with 0 or 4% added fat (tallow). The trial ended when pigs averaged approximately 220 pounds. Grain source (sorghum, corn, or wheat) did not affect average daily gain or feed efficiency of pigs during any ration phase (starter, grower, or finisher). Adding fat (to each grain ration) reduced feed intake and improved feed efficiency during each ration phase. The greatest improvement in feed efficiency from added fat was during the finishing phase.

Introduction

Considerable controversy exists among Kansas swine producers on the relative value of sorghum, corn, or wheat in swine rations. Wheat (hard red winter) contains approximately the same energy as corn or sorghum and has a higher protein content. Wheat has more of the critical essential amino acids, for swine (lysine, tryptophan and threonine). Normally wheat contains 0.1% more lysine than corn or sorghum. Limited information is available comparing corn, sorghum, and wheat in starter, grower and finisher rations.

We evaluated corn, sorghum, and wheat in starter, grower, and finisher rations with all rations formulated on a lysine basis to take maximum advantage of the increased lysine content of wheat. We also evaluated effects of adding 0 or 4% fat to each grain source.

Procedures

Ninty-six crossbred pigs averaging 8.3 kg (19.3 lbs.) were randomly alloted from outcome groups (formed on the basis of sex and initial weight), to six treatments: three grain sources (sorghum, corn, or wheat), each with 0 or 4% added fat (tallow). Pigs were housed eight per pen with two pens per treatment, in an environmentally controlled, totally slatted, floor nursery during the starter phase and in a modified open-front, totally slatted building during growing and finishing phases. The trial ended when pigs averaged 100 kg (220 lbs.).

Compositions of rations used during the starter (19 - 65 lbs.), grower (65 - 146 lbs.) and finisher (146 - 220 lbs.) phases are given in tables 1, 2, and 3. Each ration was formulated on a lysine basis, to take maximum advantage of the increased lysine content of wheat. Wheat used in

this experiment contained 0.35% lysine. Sorghum and corn diets were formulated on the assumption that each contained .24% lysine. When fat was added, synthetic lysine was also added to maintain a constant calorie-lysine ratio. All rations were fed in meal form.

Results and Discussion

Performances of pigs fed corn, sorghum, or wheat with 0 or 4% added fat for each phase (starter, grower, and finisher) are shown in table 4. Grain source did not affect average daily gain or feed efficiency during any phase (19 to 226 pounds).

Adding 4% fat slightly improved gain during the starter and grower phases and significantly ($P<.05$) improved gain during the finishing phase. Adding fat improved feed efficiency during all phases, with the greatest improvement during the finishing phase. Pigs fed the various grains responded similarly to added fat.

These results demonstrate that swine producers should not hesitate to feed wheat or sorghum, during any ration phase (starter, grower, or finisher). The decision on which grain to feed should depend on price and availability. Formulating rations on a lysine basis, feeding wheat resulted in a saving of 66 pounds of soybean meal in starter rations, 70 pounds in grower rations, and 86 pounds of soybean meal in the finisher rations, per ton of complete feed.

Adding 4% fat improved feed efficiency 9 to 12% for the entire trial.

Table 1. Composition of starter rations.

Grain source	Sorghum	Corn	Wheat
Ingredients	Pounds/ton		
Sorghum	1375		
Corn		1375	
Wheat			1443
Soybean meal	540	540	474
Dicalcium phosphate	30	30	26
Limestone	28	28	30
Salt	10	10	10
Vitamin premix	10	10	10
Trace-mineral premix	2	2	2
Antibiotic premix	5	5	5
	2000	2000	2000
Crude protein, %	17.91	17.91	19.66
Lysine, %	.92	.92	.92
Calcium, %	.90	.90	.90
Phosphorus, %	.70	.70	.70

Table 2. Composition of grower rations.

Grain source	Sorghum	Corn	Wheat
Ingredients	Pounds/ton		
Sorghum	1541		
Corn		1541	
Wheat			1613
Soybean meal	386	386	316
Dicalcium phosphate	24	24	18
Limestone	22	22	26
Salt	10	10	10
Vitamin premix	10	10	10
Trace-mineral premix	2	2	2
Antibiotic premix	5	5	5
	2000	2000	2000
Lysine, %	.73	.73	.73
Calcium, %	.70	.70	.70
Phosphorus, %	.61	.61	.61

Table 3. Composition of finisher rations.

Grain source	Sorghum	Corn	Wheat
Ingredients	Pounds/ton		
Sorghum	1625		
Corn		1625	
Wheat, hard red winter			1715
Soybean meal	300	300	214
Dicalcium phosphate	26	26	20
Limestone	22	22	24
Salt	10	10	10
Vitamin mix	10	10	10
Trace mineral mix	2	2	2
Antibiotic	5	5	5
	2000	2000	2000
Lysine, %	0.60	0.60	0.60
Calcium, %	0.70	0.70	0.70
Phosphorus, %	0.61	0.61	0.62

Table 4. Pig performance as influenced by grain source and 0 or 4% added fat.[a]

Grain source Added fat, %	Sorghum 0	Corn 0	Wheat 0	Sorghum 4	Corn 4	Wheat 4
Starter phase (8.3 - 29.7 kg) (18.3 - 65.3 lbs.)						
Avg. daily gain,[b] lbs.	1.20	1.23	1.18	1.22	1.21	1.26
Daily feed intake, lbs.	2.48	2.44	2.24	2.31	2.19	2.24
Feed/gain[b,c]	2.07	1.98	1.90	1.89	1.81	1.78
Grower phase (29.7 - 66.3 kg) (65.3 - 145.8 lbs.)						
Avg. daily gain,[b] lbs.	1.77	1.86	1.90	1.88	1.88	1.88
Daily feed intake, lbs.	5.27	5.13	5.47	5.21	4.93	4.83
Feed/gain[b,c]	2.98	2.76	2.88	2.77	2.62	2.57
Finisher phase (66.3 - 102.3 kg) (145.8 - 226.3 lbs.)						
Avg. daily gain,[b,c] lbs.	1.65	1.73	1.62	1.83	1.80	1.70
Daily feed intake lbs.	6.12	6.47	5.95	6.04	5.71	5.66
Feed/gain[b,c]	3.71	3.74	3.67	3.30	3.17	3.33
Entire trial (8.3 - 102.3 kg) (18.3 - 226.3 lbs.)						
Avg. daily gain, lbs.	1.56	1.62	1.56	1.66	1.64	1.64
Daily feed intake lbs.	4.73	4.86	4.68	4.44	4.29	4.30
Feed/gain[b,c]	3.03	3.00	3.00	2.78	2.65	2.62

[a]Each value is the mean of two pens of eight pigs each.

[b]Differences between grain sources not statistically significant ($P<.05$)

[c]Significant ($P<.05$) effect from added fat.