NCR-42 Co-operative Study

Effect of Choline Supplementation to Corn-Soybean Meal Rations on Pig Performance

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Summary

Eight-four crossbred gilts initially averaging 8.2 kg. (18.0 lbs.) were used to evaluate the effects of supplemental choline to corn-soybean meal rations on pig performance. Four levels of choline were fed during each ration phase (starter, grower, finisher). The trial was terminated when pigs within a replicate averaged approximately 100 kg. (220 lbs.). Supplemental choline had no significant effect on average daily gain or feed efficiency.

Introduction

Recent research has demonstrated that adding 400 to 700 grams of supplemental choline, per ton of complete feed, to rations fed to swine during breeding, gestation, and lactation is beneficial. This experiment was conducted to determine if supplemental choline is needed in starter, grower, or finisher rations when soybean meal is the supplemental protein source.

Experimental Procedures

Eighty-four crossbred gilts averaging 8.2 kg. (18.0 lbs.) were randomly assigned 12 pens representing three replications of four dietary treatments. Composition of the basal rations used during the starter (18-54 lbs.), grower (54-134 lbs.) and finisher (134-200 lbs.) is given in table 19 . The level of soybean meal was reduced and supplemental lysine added to obtain a relatively low level of choline in the basal rations. Pigs were housed on a totally slatted floor in an environmentally controlled nursery during the starter phase and in a modified open-front, totally slatted building during the growing and finishing phases. The trial was terminated when pigs within a replicate averaged 100 kg. (200 lbs.).

Results and Discussion

Performance of pigs fed various choline levels during each phase (starter, grower, finisher) is shown in table 20 . Supplemental choline did not significantly improve average daily gain or feed efficiency during any ration phase. These results suggest supplemental choline is not necessary if soybean meal is the supplemental protein used in normal starter, grower, or finisher swine rations.

Table 19 . Composition of basal rations fed to pigs at three phases of development.

Ingredient	Phase of production		
	Starter	Grower	Finisher
	----------%----------		
Corn	74.9	83.96	89.335
Soybean meal (44%)	21.2	12.4	7.0
Dicalcium phosphate	1.5	1.2	1.3
Limestone	0.9	0.9	0.9
Salt	0.3	0.3	0.3
L-Lysine HCL (feed grade 98%)	0.20	0.24	0.165
Vitamin, trace mineral, antibiotic premix	1.00	1.00	1.00
	100.00	100.00	100.00
Calculated Analysis			
Crude protein, %	16.1	12.9	10.9
Lysine, %	.95	.75	.55
Tryptophan, %	.15	.11	.08
Methionine + Cystine, %	.53	.46	.41
Calcium, %	.63	.60	.60
Phosphorus, %	.60	.52	.50
Choline, mg./lb.	487	397	342

Table 20 . Pig performance as influenced by choline levels.[a]

Diets	A	B	C	D
Starter phase (8.2 - 24.3 kg.) (18.0 - 53.5 lbs.)				
Added choline, g/ton	0	56	112	224
Avg. daily gain, lbs.	0.93	0.88	0.89	0.92
Feed/gain	1.85	1.98	1.93	1.94
Grower phase (24.3 - 60.8 kg.) (53.5 - 133.8 lbs.)				
Added choline, g/ton	0	90	180	360
Avg. daily gain, lbs.	1.37	1.46	1.33	1.42
Feed/gain	2.73	2.68	2.80	2.83
Starter and grower combined				
Avg. daily gain, lbs.	1.18	1.21	1.14	1.21
Feed/gain	2.44	2.46	2.51	2.54
Finisher phase				
Added choline, g/ton	0	90	180	360
Avg. daily gain, lbs.	1.78	1.78	1.77	1.84
Feed/gain	3.28	3.33	3.33	3.50
Starter-grower-finisher combined				
Avg. daily gain, lbs.	1.38	1.41	1.35	1.42
Feed/gain	2.80	2.83	2.87	2.96

[a]Each value represents the mean of three pens of seven pigs each.