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Richard C. Wahlstrom
South Dakota State University

George W. Libal

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High-Protein Oats in Ground and Pelleted Pig Starter Diets

Richard C. Wahlstrom and George W. Libal

Oat varieties have been shown to have a wide range in protein content. Research reported previously at this station has shown that Spear oats has a high protein content and also a high lysine content compared to many other oat varieties. It was also shown that this oats could constitute up to 40% of a starter diet when fed as a ground, mixed diet. One of the problems encountered was that ground diets of 40% or more oats have a tendency to bridge in the feeder so that feed may not always be available in the feeder cups.

The objectives of this experiment were to obtain further information on levels of Spear oats in ground diets and to determine the level of Spear oats that could be included in starter diets when the diets were fed in pelleted form.

Experimental Procedure

Trial 1. One hundred twenty-six crossbred pigs averaging about 20 lb. in initial weight were allotted to three replicates of seven treatments. Each pen contained six pigs. The pigs were housed in an enclosed building having solid concrete floors that were bedded with shavings. Feed and water were provided ad libitum during the 4-week trial.

The composition of the diets which were fed in ground form is shown in table 1. The Spear oats analyzed 17.5% protein and .66% lysine on a 90% dry matter basis. All diets were formulated to contain .92% lysine. The dietary treatments contained 0, 10, 20, 30, 40, 50 and 60% of oats.

Trial 2. Six replicate groups of 25 crossbred pigs averaging about 18 lb. were randomly assigned to provide five treatment groups of five pigs each within replicates. The pigs were housed in pens having a concrete floor sloping to a gutter covered with expanded metal. Temperature was controlled and no bedding was used.

Spear oats used came from the same source as in trial 1. Diets were of the same formulation but were fed in pelleted form. Treatments consisted of the following levels of oats: 0, 30, 40, 50 and 60 percent.

Results

Trial 1. A summary of the effect of various levels of Spear oats in ground diets for young pigs is shown in table 2. There were significant differences in average daily gain among treatments. The best gains (.85 lb. per day) were made by pigs fed diets containing 20% oats, with gains decreasing to .69 and .64 lb. per day for pigs fed diets of 50 and 60% oats. Feed/gain was less when pigs were fed diets of 10 or 20% oats than when higher levels of oats were fed.

Trial 2. The effect of pelleted diets containing 0, 30, 40, 50 or 60% Spear oats on the performance of early weaned pigs is shown in table 3. There were no differences in performance of the pigs fed the various diets. Daily gains were .89, .92, .88, .99 and .87 lb. per day for pigs fed diets of 0, 30, 40, 50 or 60% Spear oats, respectively. Feed/gain was somewhat greater for pigs fed the diet of 60% oats (2.07 compared to 1.84, 1.92, 1.81 and 1.82 for the other treatments).

Summary

Two trials were conducted with a total of 276 crossbred pigs to evaluate various levels of high-protein (Spear) oats in diets for young weaned pigs. Diets were formulated to be equal in lysine content, thus soybean meal was reduced as levels of oats increased. In trial 1, ground diets were used, while in trial 2 all diets were pelleted.

The results indicated that pigs fed ground diets containing 50 and 60% oats gained .11 and .16 lb. per day less than pigs fed the corn diet. Feed/gain was increased with levels of 40, 50 and 60% oats. However, when the diets were fed in pelleted form, gains were similar at all dietary levels of oats and feed/gain was increased only at the 60% level of oats.

The results indicate that the young weaned pig can utilize relatively high levels of high-protein Spear oats. Each 10 lb. of oats replaced approximately 8.6 lb. of corn and 1.4 lb. of soybean meal in the diets.

Table 1. Composition of Diets (Percent)

Ingredients	Percent of high-protein oats						
	0	10	20	30	40	50	60
Corn	73.1	64.4	55.8	47.4	38.8	30.2	21.7
Spear oats	--	10.0	20.0	30.0	40.0	50.0	60.0
Soybean meal, 48%	24.2	22.9	21.5	20.0	18.6	17.2	15.7
Dical	1.4	1.4	1.4	1.3	1.3	1.3	1.3
Limestone	.8	.8	.8	.8	.8	.8	.8
Trace mineral salt	.4	.4	.4	.4	.4	.4	.4
Premix ^a	.1	.1	.1	.1	.1	.1	.1

^a Supplied per lb. of diet: vitamin A, 2000 IU; vitamin D, 200 IU; vitamin E, 3 IU; vitamin K, 1.2 mg; riboflavin, 1.5 mg; pantothenic acid, 6 mg; niacin, 9.6 mg; choline, 30 mg; vitamin B₁₂, 6 mcg; auroemycin, 50 mg; penicillin, 25 mg and sulfamethazine, 50 milligrams.

Table 2. Effect of High-Protein Spear Oats on Performance of Young Weaned Pigs

	Level of Spear oats						
	0	10	20	30	40	50	60
Number of pigs ^a	18	18	18	18	18	18	18
Avg. initial wt., lb.	20.0	19.7	19.7	19.9	19.7	19.7	19.8
Avg. final wt., lb.	42.3	42.0	43.4	40.2	40.9	38.9	37.8
Avg. daily gain, lb. ^b	.80	.80	.85	.72	.76	.69	.64
Daily feed consumed, lb.	1.75	1.60	1.72	1.65	1.85	1.62	1.59
Feed/gain	2.13	2.01	2.08	2.28	2.44	2.34	2.41

^a Three replicate lots of six pigs each per treatment.

^b Significant difference among treatments (P<.05).

Table 3. Effect of Pelleted Spear Oats
in Diets for Young Pigs

	Level of Spear oats				
	0	30	40	50	60
Number of pigs ^a	30	30	30	30	30
Avg. initial wt., lb.	18.2	18.1	18.1	18.2	18.2
Avg. final wt., lb.	43.3	43.8	42.9	45.8	42.5
Avg. daily gain, lb.	.89	.92	.88	.99	.87
Daily feed consumed, lb.	1.60	1.76	1.60	1.79	1.80
Feed/gain	1.84	1.92	1.81	1.82	2.07

^a Six replicate lots of five pigs each per treatment.