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ANIMAL HUSBANDRY DEPARTMENT
AGRICULTURAL EXPERIMENT STATION
SOUTH DAKOTA STATE COLLEGE, BROOKINGS

high quality oats for growing pigs



These trials indicate that high quality oats is a good feed for growing-finishing swine. The results show that you can satisfactorily use it to replace up to 40% of the corn in rations when your pigs are on pasture. When they are in dry lot you can replace up to 50% of the corn in mixed rations. Oats with a test weight of less than 35 pounds a bushel may not be as satisfactory.

High Quality Oats for Growing Pigs

RICHARD C. WAHLSTROM¹

In South Dakota oats ranks very close to corn in the number of acres harvested and bushels of grain produced. Since oats is considered a feed grain crop, its value depends on its usefulness as a livestock feed.

Most of the leading swine producing counties are also the leaders in corn and oat production. Therefore it is logical to expect that a considerable portion of the oats produced in this state is fed to hogs.

Recommendations on the use of oats in swine rations are based on research conducted approximately 20 years ago. Since that time we have acquired much information on the value of vitamins, antibiotics, and other nutrients in swine rations, so today our hogs grow more rapidly on less feed per pound of gain.

During the past few years many new oat varieties have been developed and more farmers apply fertilizers. Oats that has a test weight of from 35 to 40 pounds per bushel and above average crude protein content is more common. Because of these factors and the importance of oats as a crop and a livestock feed, it seemed desirable to obtain more information on the feeding

value of high quality oats for growing-finishing swine. The experiments reported in this publication were conducted both in dry lot and on alfalfa-brome grass pasture.

PASTURE EXPERIMENT

A total of 178 weanling pigs were used in three trials in this experiment conducted during 3 successive years. Purebred Duroc, Hampshire, Poland China, and Spotted Poland China pigs were allotted as equally as possible into four lots in trials 1 and 2 and five lots in trial 3. These pigs were self-fed on good alfalfa-brome pasture until they weighed approximately 200 pounds.

The pigs in Lot 1 were fed a ration composed of ground yellow corn, solvent soybean oil meal, and tankage and supplemented with minerals, vitamins, and an antibiotic.

Lot 2 pigs were fed a mixed ration containing the same feeds as fed to Lot 1, except that oats was added to replace part of the corn. In trials 1 and 3 the corn and oats

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were fed in a ratio of 2 parts of corn to 1 of oats, while in trial 2 the ratio of corn to oats was 1.5 to 1.

The rations fed to both Lots 1 and 2 contained approximately 15% crude protein until the pigs weighed 100 pounds and 12% crude protein from 100 pounds to market weight. The protein content was changed by decreasing the soybean oil meal and tankage and increasing the corn and/or oats.

Lots 3 and 4 were fed free choice grain and protein supplement. Shelled corn was fed as the only grain to the pigs in Lot 3, while in Lot 4 a ground mixture of corn and oats was fed as the grain. This mixture consisted of 2 parts of corn to 1 part of oats in trial 1 and 1.5 parts of corn to 1 of oats in trials 2 and 3. The same protein supplement was fed to both Lots 3 and 4. In trial 1 it was composed of equal parts of soybean oil meal and tankage and in trials 2 and 3, 2 parts of soybean oil meal were used to each part of tankage. Trace mineralized salt, steamed bonemeal, vitamins, and antibiotics were added to the protein supplement.

The oats used in this experiment, both pasture and dry lot trials, was all of good quality with a test weight of from 35 to 40 pounds per bushel.

Trial 1 Results

Forty-eight weanling pigs with an average starting weight of 31 pounds were used in this trial conducted during the summer of 1955. Results are summarized in table 1.

The average daily gain figures indicate only small differences among

the four lots. During the early feeding periods, Lots 1 and 2, which received the complete mixed rations, gained slightly faster than Lots 3 and 4, fed free choice. There was no difference between the corn or corn-oats rations during this time.

A greater variation in daily gains existed during the finishing phase (100 to 210 pound weight). Again the complete mixed ration with corn as the only grain gave the fastest rate of gain. For the entire feeding period there was essentially no difference in gains of the pigs in Lots 2, 3, and 4. Lot 1 pigs gained approximately 0.10 to 0.15 pound per day faster than the other lots.

There were no consistent differences in feed consumption in this trial. Pigs fed the complete mixed ration with corn consumed the most feed and those fed the complete mixed ration containing corn and oats consumed the least. Pigs in Lot 4, fed free choice, consumed more grain (corn-oats mixture) than did those in Lot 3 fed shelled corn. However, less protein supplement was consumed by the pigs fed the grain mixture of 2 parts corn and 1 of oats than was consumed by the pigs fed shelled corn as their grain. The pigs would need slightly less protein supplement since oats is higher in protein content than corn.

Lot 2 pigs required about 30 pounds less feed per 100 pounds of gain than did the other three lots. Since the pigs in Lot 2 also consumed less feed per day, it is possible that they might have consumed more pasture than the other lots. The feed efficiency of Lot 2 re-

sulted in that group having the least feed cost per 100 pounds of gain. Lot 4, although having the highest feed requirement, had the next lowest feed cost as a result of a lower consumption of protein supplement.

Trial 2 Results

This trial, conducted during 1956, was similar to trial 1 of the previous

year. Forty pigs were used and divided into four lots of 10 pigs each. The feeding treatments differed from trial 1 in that Lots 2 and 4 were fed a corn-oats mixture in a ratio of 1.5 parts of corn to 1 of oats instead of 2 to 1. The results of this trial are presented in table 2.

The pigs fed the complete mixed rations gained slightly faster than

**Table 1. A Comparison of Corn and Corn-Oats Rations
For Growing-Finishing Swine on Pasture
(Trial 1. May 23 to September 21, 1955)**

	Lot 1 Complete Mixed Ration, Corn as Only Grain*	Lot 2 Complete Mixed Ration, Corn and Oats as Grain†	Lot 3 Free Choice Shelled Corn and Protein Supplement‡	Lot 4 Free Choice Corn-Oats§ Mix- ture and Protein Supplement
No. of pigs **	11	11	10	12
Av. number days on feed	117	122	124	121
Av. initial weight, lb.	31	32	32	31
Av. final weight, lb.	216	209	210	209
Av. daily gain, lb.				
To 100 lb.	1.29	1.27	1.23	1.19
100 to 210 lb.	1.85	1.61	1.59	1.72
Av. for experiment	1.58	1.45	1.43	1.47
Av. daily feed				
Grain	—	—	3.96	4.72
Protein supplement	—	—	.90	.51
Total feed	5.45	4.58	4.86	5.23
Feed per cwt. gain, lb.				
Grain	—	—	280	321
Protein supplement	—	—	63	34
Total feed	347	316	343	355
Feed cost per cwt. gain	10.15	8.62	9.89	9.49

*Ration composed of 87 parts corn, 6 soybean meal, 6 tankage, 0.5 trace mineral salt, 0.4 steamed bonemeal, and 0.1 vitamin-antibiotic supplement to 100 pounds. From 100 to 200 pounds: 91 parts corn, 4 soybean meal, 4 tankage, (mineral and vitamin-antibiotic additions same as for first 100 pounds).

†Ration composed of 59.8 parts corn, 29.9 oats, 5 soybean meal, 5 tankage, 0.5 trace mineral salt, 0.4 steambone meal, 0.1 vitamin antibiotic to 100 pounds. From 100 to 200 pounds: 62.6 corn, 31.3 oats, 2.9 soybean meal, 2.9 tankage, 0.5 trace mineral salt, 0.4 steambone meal, 0.1 vitamin-antibiotic.

‡Supplement composed of 48 parts soybean meal, 48 tankage, 2 trace mineral salt, 1.5 steambone meal, 0.5 vitamin-antibiotic.

§2 parts corn to 1 part oats.

**Initially there were 12 pigs per lot. Four died of heat prostration July 30.

Table 2. A Comparison of Corn and Corn-Oat Rations for Growing-Finishing Swine on Pasture (Trial 2. June 4 to October 3, 1956)

	Lot 1 Complete Mixed Ration, Corn only Grain*	Lot 2 Complete Mixed Ration Corn and Oats as Grain†	Lot 3 Free Choice Shelled Corn and Protein Supplement‡	Lot 4 Free Choice Corn-Oats§ Mixture and Pro- tein Supplement
No. of pigs.....	10	10	10	9**
Av. number days on feed	107	111	117	111
Av. initial weight, lb.	29	29	29	28
Av. final weight, lb.	207	207	200	199
Av. daily gain, lb.				
To 100 lb.	1.41	1.38	1.20	1.34
100 to 200 lb.	1.92	1.83	1.76	1.78
Av. for experiment	1.65	1.61	1.46	1.54
Av. daily feed				
Grain	—	—	4.35	4.95
Protein supplement	—	—	0.86	0.58
Total feed	4.99	4.80	5.21	5.53
Feed per cwt. gain, lb.				
Grain	—	—	297	322
Protein supplement	—	—	59	38
Total feed	302	299	356	360
Feed cost per cwt. gain	8.51	7.78	9.80	9.35

*Ration composed of 84 parts corn, 10 soybean meal, 5 tankage, 0.7 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic supplement to 100 pounds. From 100 to 200 pounds: 91 parts corn, 5 soybean meal, 2.5 tankage, 1.0 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic.

†Ration composed of 53 parts corn, 35 oats, 8 soybean meal, 4 tankage, 0.7 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic to 100 pounds. From 100 to 200 pounds: 57 parts corn, 38 oats, 3 soybean meal, 1.5 tankage, 1.0 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic.

‡Supplement composed of 62 parts soybean meal, 31 tankage, 3.4 steambone meal, 3.0 trace mineral salt, 0.6 vitamin-antibiotic.

§1.5 parts corn to 1 part oats.

**One pig died June 25.

those fed free choice. This difference in rate of gain was noted both during the early and later phases of the growing period. Only a small difference in rate of gain was noted between the complete mixed rations containing only corn or corn and oats as cereal grain. Lot 3, fed shelled corn and protein supplement free choice, gained at the

slowest rate throughout the experiment. However, the most difference in rate of gain was noted during the early period from weaning to 100 pounds.

Pigs in Lots 3 and 4, fed the free choice method, consumed more feed per day than did those fed the complete mixed rations. Lot 4 again consumed more grain (corn-oats

mixture) and less protein supplement daily than did Lot 3.

Probably of most significance in this trial was the savings in feed required per hundredweight of gain when the ground mixed rations were fed. Lots 1 and 2 required approximately 19% less feed than did Lots 3 and 4 which were fed free choice. This resulted in more economical gains in Lots 1 and 2.

There was essentially no difference in the amount of feed required between the lots fed corn as the only grain or those fed the corn-oats mixture. This was true with both the ground mixed rations or the free choice rations. However, the feed costs were less for the rations containing a corn-oats mixture than for those containing corn alone (Lot 2 compared to Lot 1 and Lot 4 compared to Lot 3). This was true because of a more favorable price for oats than for corn during this season and also because less protein supplement was consumed when oats was present in the ration.

Trial 3 Results

Ninety pigs averaging about 42 pounds were used in this trial conducted in 1957. These pigs were allotted into 5 lots of 18 pigs each. The experimental treatments and the results of this trial are shown in table 3.

Again, as in the two previous trials, there was a slightly faster rate of gain when the pigs were fed complete mixed rations as compared to feeding free choice. This was particularly true during the early growing period. The slowest

rate of gain was made by the pigs fed shelled corn and protein supplement. In all three trials these pigs gained the slowest from a weight of 100 pounds to market weight and had the lowest average gain for the entire trial.

The mixed rations were consumed in greater amounts than were the rations fed free choice. Increasing the amount of oats in the mixed rations increased the total amount of feed consumed daily. When the grain and protein supplement were fed free choice the grain mixture of 1.5 parts of corn to 1 of oats was consumed in greater amounts than was the shelled corn. However, the pigs receiving this grain mixture chose to eat less protein supplement daily than did those pigs fed shelled corn. These findings were the same as those of the two previous trials.

More feed was required to produce a unit of gain as the oats in the ration was increased. The greater amount of fiber present in the oats would be a factor in making these rations less efficient. However, in the first two trials this difference did not appear. Shelled corn and protein supplement was the most efficient ration used in this trial.

Feed costs per hundred pounds of gain varied from \$7.69 for the pigs fed corn and supplement free choice to \$9.49 when the mixed ration containing equal parts of corn and oats as the grain was fed. The price of oats per pound was higher than corn at this time and accounts for part of the spread in feed cost.

DRY LOT EXPERIMENT

The three dry lot trials in this experiment were not similar in procedure and treatment and will therefore be discussed separately.

Trial 1

Forty-eight weanling pigs were divided into four lots of 12 pigs each. They were housed and fed in

concrete pens during the trial conducted during the winter of 1956-57.

Two lots were fed, free choice, ground oats and a protein supplement. The protein supplement consisted of 44.1 parts soybean meal, 41.7 parts meat and bone scraps (50% protein), 10 parts ground alfalfa hay, 3 parts trace mineral salt,

Table 3. A Comparison of Corn and Corn-Oat Ratios for Growing-Finishing Swine on Pasture (Trial 3. June 4 to September 12, 1957)

	Lot 1 Mixed Ration Corn*	Lot 2 Mixed Ration 2 Corn to 1 Oats†	Lot 3 Free Choice Corn	Lot 4 Free Choice 1.5 Corn to 1 Oats	Lot 5 Mixed Ration 1 Corn to 1 Oats‡
No. of pigs	18	18	18	18	18
Av. number days on feed ...	100	100	100	100	100
Av. initial weight, lb.	42	42	42	42	42
Av. final weight, lb.	208	204	190	197	203
Av. daily gain, lb.					
To 100 lb.	1.44	1.40	1.31	1.27	1.40
100 to 200 lb.	1.75	1.77	1.61	1.80	1.77
Av. for trial	1.65	1.61	1.49	1.55	1.61
Av. daily feed					
Grain	—	—	3.89	4.65	—
Protein supplement§	—	—	0.68	0.44	—
Total feed	5.22	5.52	4.57	5.09	5.92
Feed per cwt. gain, lbs.					
Grain	—	—	262	300	—
Protein supplement	—	—	45	28	—
Total feed	317	342	307	328	367
Feed cost per cwt. gain	\$8.12	\$8.82	\$7.69	\$8.31	\$9.49

*Ration composed of 84 parts corn, 10 soybean meal, 5 tankage, 0.7 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic supplement to 100 pounds. From 100 to 200 pounds: 91 parts corn, 5 soybean meal, 2.5 tankage, 1.0 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic.

†Ration composed of 58 parts corn, 29 oats, 8 soybean meal, 4 tankage, 0.8 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic to 100 pounds. From 100 to 200 pounds: 62 corn, 31 oats, 3.6 soybean meal, 1.8 tankage, 1.0 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic.

‡Ration composed of 45 parts corn, 45 oats, 6 soybean meal, 3 tankage, 0.9 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic to 100 pounds. From 100 to 200 pounds: 47 parts corn, 47 oats, 3 soybean meal, 1.5 tankage, 1.0 steambone meal, 0.5 trace mineral salt, 0.1 vitamin-antibiotic.

§Supplement composed of 62 parts soybean meal, 31 tankage, 3.4 steambone meal, 3.0 trace mineral salt, 0.6 vitamin-antibiotic.

and 1.2 parts of a vitamin-antibiotic mixture. This mixture supplied 72 milligrams of vitamin B₁₂, 16 grams of riboflavin, 32 grams of pantothenic acid, 72 grams of niacin, 80 grams of choline, and 80 grams of chlortetracycline per ton of protein supplement.

The other two lots of pigs received a complete ground and mixed ration. This ration was composed of 86 parts of a corn-oats mixture (1.5 parts corn to 1 part oats) and 14 parts of the protein supplement. When the pigs weighed about 110 pounds the ration was changed to 93 parts of the corn-oats mix and 7 parts of supplement.

Two varieties of oats were used, but since there was little apparent difference between these varieties (as reported in *South Dakota Farm and Home Research*, August 1957, pp. 19-21), the data are combined here and a comparison is made of the two methods of feeding only.

Results. The results of this trial are shown in table 4. The pigs fed the mixed ration consumed less total feed daily while gaining 0.1 lb. per day faster than those pigs fed ground oats and protein supplement free choice. These pigs also required approximately 60 pounds less feed per hundred pounds of gain than those fed free choice. This resulted in an increased feed cost per hundred pounds of gain of \$1.80 when oats was fed as the only cereal grain.

These results point out quite clearly that more feed is required to produce a market hog when oats is fed free choice as the only grain to

growing pigs compared to feeding a complete mixed ration containing corn and oats. Therefore, unless oats is cheaper than corn on a pound per pound basis, the feed cost would be higher.

Trial 2

Forty crossbred pigs were used in this trial conducted during the late winter and early spring of 1957. These pigs were about 7 weeks of age when they were allotted into four comparable groups of 10 pigs each. Each group of pigs was kept in a concrete floored pen equipped with an automatic waterer and the rations were self-fed in connecting outside pens. The composition of the rations used is shown in table 5.

Table 4. Oats in Rations for Pigs Fed on Concrete Dry Lot (Trial 1, Oct. 23, 1956 to March 4, 1957)

	Lots 1 and 2 Gr. Oats and Protein Suppl. Free Choice	Lots 3 and 4 Mixed Ration of Corn, Oats and Suppl.
No. of pigs	24	24
Av. initial wt., lb.	38	38
Av. final wt., lb.	202	206
Av. daily gain, lb.	1.34	1.44
Av. days on trial	122	117
Av. daily feed, lb.		
Oats	5.36
Supplement	0.76
Total	6.12	5.67
Feed per cwt. gain, lb.		
Oats	400
Supplement	56
Total	456	395
Feed cost per cwt. gain	\$11.99	\$10.19

Table 5. Composition of Rations Used in Dry Lot, Trial 2 (percent)

Ingredients	Ration Designation			
	A	B	C	D
Ground yellow corn	84.0	44.0	91.0	47.0
Ground oats		44.0		47.0
Soybean oil meal	10.0	7.4	5.0	3.0
Tankage	5.0	3.7	2.5	1.5
Steamed bonemeal	0.7	0.7	1.0	1.0
Trace mineral salt	0.5	0.5	0.5	0.5
Vitamin-antibiotic mixture*	0.15	0.15	0.15	0.15

*Furnished 1 mg. riboflavin, 2 mg. calcium pantothenate, 4.5 mg. niacin, 5 mg. choline, 4.5 mcg. vitamin B₁₂ and 5 mg. chlortetracycline per pound of ration.

Results. The performance of all four lots was very satisfactory with only slight differences in rate of gain and feed efficiency between the various treatments, as shown in table 6. Pigs in Lots 1 and 2, which were fed corn as the only cereal grain, gained about 0.1 pound per day faster than those fed equal parts of corn and oats during the initial phase. During the period from 100 to 200 pounds, the pigs in

Lots 1 and 4, which remained on rations of corn and corn and oats respectively, had almost identical gains. However, changing from corn to a corn-oats mixture at 100 pounds appeared to slow down gains (Lot 2), while changing from a corn-oats mixture to corn resulted in increased gains (Lot 3).

In this trial only small differences existed in the amount of feed required to produce each hundred

Table 6. Results of Feeding Corn and Corn-Oat Mixtures During Different Periods to Growing Pigs in Dry Lot (Trial 2. January 31 to May 23, 1957)

	Lot 1	Lot 2	Lot 3	Lot 4
	A	A	B	B
Ration fed to 100 lb.—	C	D	C	D
No. of pigs	10	10	10	10
Av. initial wt., lb.	30	30	30	30
Av. days on trial	102	105	101	105
Av. final wt., lb.	205	204	207	204
Av. daily gain 30-100 lb.	1.53	1.53	1.45	1.42
Av. daily gain 100-200 lb.	1.88	1.77	2.03	1.87
Av. daily gain 30-200 lb.	1.71	1.66	1.75	1.66
Feed per cwt. gain, 30-100 lb.	284	271	275	288
Feed per cwt. gain, 100-200 lb.	425	404	398	413
Feed per cwt. gain, 30-200 lb.	365	347	349	363
Feed cost per cwt. gain	\$9.46	\$8.97	\$9.02	\$9.38
Av. backfat probe, inches	1.63	1.52	1.65	1.51

pounds of gain. Lots 2 and 3, which received corn for one period and the corn-oats mixture for one period, were the most efficient and this is reflected in slightly lower feed costs per unit of gain.

As each pig reached approximately 200 pounds, its backfat was measured by making an incision in the skin and inserting a small steel rule through the fat. Three measurements were taken and the average value is given in table 6. The pigs fed the corn-oats mixture during the entire period or the period from 100 to 200 pounds in weight averaged 0.11 to 0.14 inches less backfat than those fed corn during similar periods.

Trial 3

Forty-eight Duroc, Hampshire, and Poland China pigs averaging approximately 40 pounds were allotted into four groups for this trial during the summer of 1957. Management procedures were the same

as for the other dry lot trials. Complete ground and mixed rations were used with each lot receiving a different ratio of corn and oats. The treatments in this trial are described in table 7.

Results. The two groups of pigs (Lots 1 and 2) fed all corn or 2 parts of corn to 1 oats as the cereal grain portion of their ration gained at approximately the same rate (table 7). This was true during both the early and later growth phases. When the oats was increased to give corn to oats ratios of 1:1 or 1:2, there was a slight decrease in rate of gain during the period from weaning to 100 pounds. This was particularly the case when the corn-oats ratio was 1:2. However, from 100 to 200 pounds the pigs in these lots gained about as rapidly as did those in Lots 1 and 2.

The feed efficiency of all lots was very uniform. This resulted in only small differences in feed cost between the various treatments.

Table 7. A Comparison of Corn and Corn-Oat Rations for Growing-Finishing Swine in Dry Lot (Trial 3, May 24 to September 6, 1957)

Grain Mixture—	Lot 1	Lot 2	Lot 3	Lot 4
	Corn	2 Corn to 1 Oats	1 Corn to 1 Oats	1 Corn to 2 Oats
No. of pigs*	12	11	11	12
Av. number of days on feed.....	100	99	102	107
Av. initial wt., lb.	40	40	40	40
Av. final wt., lb.	205	204	205	206
Av. daily gain, lb.				
To 100 lb.	1.49	1.48	1.41	1.32
100 to 200 lb.	1.76	1.78	1.75	1.74
Av. for trial	1.65	1.65	1.61	1.56
Av. daily feed, lb.	6.16	6.01	5.97	5.70
Feed per cwt. gain, lb.	373	364	371	366
Feed cost per cwt. gain	\$ 9.69	\$ 9.40	\$ 9.58	\$ 9.46

*One pig died in each of Lots 2 and 3. Data in these lots are for 11 pigs.

SUMMARY

Six feeding trials, three on pasture and three in dry lot, were conducted in which 316 weanling pigs were used to study the value of high quality oats in growing-finishing pig rations. Oats having a test weight of from 35 to 40 pounds per bushel were used in these trials conducted during a 3-year period 1955-57.

Pigs on pasture were fed ground and mixed rations containing corn as the only grain or corn and oat grain mixtures containing 2, 1.5, or 1 pound of corn to each pound of oats. These rations were compared with feeding pigs grain and supplement free choice where the grain was either shelled corn or a ground mixture of 2 or 1.5 parts of corn to 1 of oats.

Slightly faster rates of gain were obtained when the pigs were fed ground and mixed rations than when they were fed free choice. This was true regardless of the grain mixture. The greatest difference in rate of gain between the mixed and free choice rations was noted during the early part of the feeding period, up to a weight of 100 pounds. Corn as the only grain in a mixed ration gave small, insignificant increases in gain over the corn and oat mixtures. When fed free choice, the corn-oat mixture resulted in faster gains than shelled corn.

Some variation existed in feed efficiency of the various rations from year to year. Average results indicate that less feed was required to produce a hundred pounds of

pork when the pigs were fed mixed rations than when fed free choice. Little differences in feed requirements were noted when oats replaced up to 40% of the corn in mixed rations. More feed was required per unit of gain in the one trial in which half of the corn was replaced with oats. When fed free choice the pigs fed shelled corn and protein supplement required less total feed but more protein supplement than those fed a grain mixture of corn and oats.

In one dry lot trial, feeding oats and protein supplement free choice produced slower and less efficient gains than when a mixed ration containing 1.5 parts of corn to 1 of oats was fed. The feed cost per hundred pounds of pork produced was also much higher when oats was fed as the only grain.

Pigs fed rations in which the grain portion was composed of equal amounts of corn and oats, gained slightly slower from weaning to 100 pounds than those fed corn as the only grain. Changing from a corn-oats ration to a corn ration at 100 pounds resulted in improved gains but also fatter hogs. Changing from a corn ration to a corn-oats ration at 100 pounds decreased gains slightly but the pigs had less fat than those that remained on the corn ration for the entire trial. Feed required per unit of gain was similar for all methods of feeding.

In another trial oats replaced none, one-third, one-half, and two-thirds of the corn in a complete ground and mixed ration. Gains

were reduced a little when one-half of the corn was replaced with oats and slightly more when two-thirds of the grain mixture was oats. Most of this reduction in gain occurred during the period from 40 to 100 pounds in live weight.

Results show that high quality oats is an excellent feed for growing-finishing swine. The results indicate that it may satisfactorily replace up to 40% of the corn in rations fed on pasture and up to 50% of the corn in mixed rations fed in dry lot. Higher amounts of oats in the ration will decrease gains and increase the amount of feed needed to produce the gain.

Results such as were obtained in the trials reported here would not be expected if the oats had a test weight of less than 35 pounds per bushel. The amount of high quality oats to use in swine rations up to the maximums suggested will depend on the relative prices of corn and oats. If the price of high quality oats per pound is less than that of corn, it would be more economical to use the maximum amount of oats. When the price is very little different it may depend on the availability of the two grains. If corn is the lower priced grain there would be no advantage of using oats in rations for growing pigs.

APPENDIX

Appendix Table 1. Feed Ingredient Prices Per Hundredweight Used in Calculating Feed Costs

	1955	1956	1957
Shelled corn	\$2.54	\$2.45	\$2.20
Oats	2.01	1.90	2.29
Soybean oil meal	3.50	3.85	3.25
Tankage	4.50	3.70	4.50
Steamed bonemeal	4.85	4.85	4.50
Trace mineral salt	2.30	2.55	2.70
Vitamin-antibiotic premix	63.00	63.00	63.00
Grinding and mixing13	.13	.13