crease the data obtained on the performance of bulls under feedlot conditions.

Thus far in the study, the Wernacre Premier calves have been more highly inbred than the Mercury calves. The Wernacre Premier calves have made slightly higher gains, but have required more feed per 100 pounds of live body weight gain than have the Mercury calves.

The initial weight and average daily gain have appeared to be related to feed efficiency. Calves possessing lighter initial weights and those making higher average daily gains within each line tend to be more efficient in feed utilization. Inbreeding has not appeared to be related to gaining ability or feed efficiency in either of the two lines.

The data for the 1957 calves are summarized in Table 28, and a partial summary of the 1958 calves appears in Table 29. Later these data will be summarized with those obtained in previous years for more conclusive analyses.

Swine

The Comparative Value of Shelled Corn and Hybrid Grain Sorghum Prepared for Feeding by Different Milling Processes. Project 110-2.

C. E. Aubel

Grain sorghums are being grown extensively in many parts of Kansas. Feeding tests with swine at this station have given excellent results when sorghum grain was compared with corn. Hybrid sorghum grains also have done well in the feedlot.

Mills and elevators now can process grains in ways not previously possible. Interest in the new processes is increasing because they may improve the efficiency of the grains for feeding and thus provide more profit in hog raising.

Five lots of pigs were self-fed free choice in drylot. All lots received a mixed animal and plant protein supplement of 4 parts tankage, 4 parts soybean meal, 1 part cottonseed meal, and 1 part alfalfa meal. The ration for each lot varied in the following manner:

Lot 1. Whole hybrid sorghum grain.

Lot 2. Steam rolled hybrid sorghum grain.

Lot 3. Steam rolled hybrid sorghum grain with 5 percent molasses mixed in it.

Lot 4. Steamed hybrid sorghum with rolling or crimping delayed four hours.

Lot 5. Shelled corn.

The sorghum grain was steamed at 90 pounds pressure at 180° F.

Results of this experiment are presented in Table 30.

Table 30

The comparative value of shelled corn and hybrid grain sorghum prepared for feeding by different milling processes.

December 11, 1958, to March 21, 1959—100 days.

Ration fed	Whole hybrid sorghum, protein-mixed supplement	Steam rolled hybrid sorghum, protein-mixed supplement	Steam rolled + molasses hybrid sorghum, protein-mixed supplement	Steam rolled delayed crimp hybrid sorghum, protein-mixed supplement	Shelled corn, protein-mixed supplement
Lot number	1	2	3	4	5
Number pigs per lot	10	8	10	10	10
Av. initial wt. per pig, lbs.	53.10	53.20	53.10	53.40	53.00
Av. final wt. per pig, lbs.	180.60	165	193.50	177	181
Av. total gain per pig, lbs.	127.50	112.80	140.40	123.60	128
Av. daily gain per pig, lbs.	1.27	1.12	1.40	1.23	1.28
Av. daily ration per pig, lbs.:					
Milo	4.52	4.32	5.58	4.88	
Shelled corn					4.19
Protein supplement	.66	.67	.76	.67	.71
Pounds feed per 100 lbs. gain per pig:					
Milo	354.50	403.36	397.72	395.22	
Shelled corn					327.34
Protein supplement	52	60.17	54.20	61.56	55.62

Observations

The pigs in lot 3 receiving steam rolled grain sorghum with 5 percent molasses ate the most feed per day and made the largest gains, but did not convert their feed the most economically.

The whole-sorghum-grain-fed pigs in lot 1 made as rapid daily gains as the corn-fed pigs, but were not quite as efficient in their feed conversion.

All factors considered, the sorghum grains proved satisfactory. This is consistent with other experiments conducted at this station.

Metabolism of Carotenoid Pigments and Vitamin A by Swine. Project 311.

D. B. Parrish and C. E. Aubel

Previous work has indicated that vitamin A utilization and storage are reduced when pigs are infected with roundworms. Hygromix (S. hygroscopicus fermentation product, Lilly) has been used to reduce worm infection in growing pigs. This test was to determine whether pigs with worm infection made less effective use of provitamin A from dehydrated alfalfa than did pigs in which worm infestation was reduced by feeding Hygromix.

The liver and blood stores of 18 weanling pigs were reduced by feeding a vitamin A-free diet. When the pigs weighed an average of 53 pounds and serum vitamin A levels were reduced to an average of 12 micrograms per 100 mls., they were divided into six lots of three pigs each. Each lot was fed a pelleted growing feed composed of sorghum grain, soybean meal, brewer's yeast, dried skimmilk, bone meal, calcium carbonate, salt, and a trace mineral—vitamin premix. A high-potency alfalfa was added to supply 600 units of vitamin A activity per pound. Three lots of pigs received 2½ pounds of Hygromix per 1000 pounds of feed, and three comparable lots did not receive Hygromix. The pigs were fed for 2 months, given the quantity that they would clean up. At the end of the experiment, data on weights, feed consumption, serum vitamin A levels, and ascarid egg counts in feces were obtained. The data are in Table 31.

Table 31

Effect of Hygromix in ration on vitamin A levels of blood serum.

Diet	Lot[1]	Av. wt. gain, lbs.	Lbs. feed per lb. gain	No. pigs infected, ascarid eggs	Vitamin A, micrograms per 100 mls. serum
Contains Hygromix ..	1	117	3.20	1	19.3
	2	140	3.07	0	18.4
	3	109	3.22	1	18.6
No Hygromix	4[2]	111	3.18	2	21.6
	5	133	2.85	2	22.8
	6	112	3.14	1	20.9

1. Three pigs per lot.

2. One pig lost 6 days before experiment ended. Death rather sudden, cause not determined.

Observations

In this test the pigs had only a mild worm infection. Fewer pigs receiving Hygromix were found to have ascarid eggs in the feces than those not receiving Hygromix. The differences in serum vitamin A levels and growth are not significant; therefore, pigs receiving Hygromix did not utilize the provitamin A, carotene, from alfalfa meal more effectively than those not receiving Hygromix.

The Value of the Antibiotics, Terramycin (TM-10) and Oleandomycin, in the Protein Supplement for Fattening Fall Pigs in Drylot in Winter. Project 110-1.

C. E. Aubel

A new antibiotic, Oleandomycin, has been brought out recently by Chas. Pfizer & Co., Inc.[1] This experiment was to test the value of this antibiotic.

Three lots of pigs were self-fed shelled corn and a mixed protein supplement as a basal ration. Each lot contained 10 pigs.

Lot 1 pigs were fed in drylot and received a mixed protein supplement of 4 parts tankage, 4 parts soybean meal, 1 part cottonseed meal, and 1 part alfalfa meal.

Lot 2 pigs were fed in drylot and received the same protein supplement as lot 1, with 4½ pounds of Terramycin TM-10 added per ton of protein mixture.

Lot 3 pigs were fed in drylot and received the same protein supplement as lot 1, with 4½ pounds of Terramycin TM-10 and 4½ pounds of Oleandomycin premix added per ton of protein mixture.

Table 32 gives the results of this experiment.

1. Chas. Pfizer & Co., Inc., Terre Haute, Ind., supplied the Terramycin supplement TM-10 and Oleandomycin for this experiment.

Table 32

The value of the antibiotics Terramycin (TM-10) and Oleandomycin in the protein supplement for fattening fall pigs in drylot in winter.

December 11, 1958, to March 21, 1959—100 days.

Basal ration fed: Shelled corn, mixed protein supplement in the drylot	Basal	Basal + 4½ lbs. per ton Terramycin TM-10 per ton supplement	Basal + 4½ lbs. Terramycin TM-10, 4½ lbs. Oleandomycin per ton of supplement
Lot number	1	2	3
No. pigs in lot	10	10	10
Av. initial wt. per pig, lbs.	53	53.20	53.40
Av. final wt. per pig, lbs.	181	182.50	189.50
Av. total gain per pig, lbs.	128	129.30	136.10
Av. daily gain per pig, lbs.	1.28	1.29	1.36
Av. daily ration per pig, lbs.:			
Shelled corn	4.19	4.10	4.44
Protein supplement	.71	.69	.74
Lbs. feed per 100 lbs. gain per pig:			
Shelled corn	327.34	317.09	326.45
Protein supplement	55.62	53.75	54.73

Observations

In this experiment the pigs that received the Terramycin (TM-10) and Oleandomycin made the largest daily gains. They exceeded gains made by the lot 2 pigs that received the Terramycin (TM-10) supplement. Quantity of feed consumed per 100 pounds gain of grain and protein supplement varied little.

The results of this experiment seemed to indicate that adding Terramycin (TM-10) to the ration helped some in feed conversion but decreased rate of gain slightly. When both antibiotics were added to the ration, daily gains were a little larger but feed conversion was improved very little.

See note on swine improvement testing facility on page 64.