

Pigs in lot 4 gained as well and were as efficient as those in the other three lots even though they had grown more slowly before going on test. Under the conditions of this study, antibiotics did not improve the performance of healthy pigs, but slow-growing pigs apparently responded to antibiotics in their ration. Doctor Griffing found evidence of gastric ulcers in pigs from all groups.

**Corn vs. Sorghum, Pellets vs. Meal, and Soybean Oil Meal vs. a Mixed Protein for Growing-Finishing Pigs (Project 110).**

B. A. Koch

Growing-finishing pigs, confined and fed on concrete, were used in a factorial-type experiment designed to study several problems at one time.

**Experimental Procedure**

One hundred forty feeder pigs weighing approximately 60 to 80 pounds each and averaging 12 weeks of age were randomly divided by weight into groups of 14 pigs each. The pigs had been vaccinated previously for hog cholera and had been wormed with piperazine. All pigs had been on concrete from birth and they had been raised under complete confinement.

Each group of 14 pigs was placed in a pen 7 feet wide by 28 feet long with 16 feet of the pen under roof. Complete rations, either meal or pellets, were self-fed. An all-steel three-hole self-feeder was used in each pen. Water was always available from automatic waterers. Fog

Table 24

Basal rations fed to growing-finishing pigs in comparing corn vs. sorghum grain, pelleted vs. meal rations, and soybean oil meal vs. a mixture of proteins.<sup>1,2</sup>

Ration no. ....	30, 31, 32, 33	39, 40	34, 35	36, 37
Corn or sorghum, lbs. ....	1,544	1,544	1,522	1,824
Soybean oil meal, lbs. ....	202	202	403	318
Dehydrated alfalfa meal, lbs. ....	60	60		
Molasses, lbs. ....	50	50		
Meat scraps, lbs. ....	60	60		
Fish meal, lbs. ....	40	40		
Dicalcium phosphate, lbs.	15	15	20	24
Limestone, lbs. ....	8	8	20	16
Salt, lbs. ....	10	10	10	10
Trace-mineral (5% zn.), lbs. ....	1	1	1	1
Vitamin A, I.U. ....	2,000,000	2,000,000	3,000,000	3,680,000
Vitamin D, I.U. ....	300,000	300,000	300,000	150,000
Vitamin E, I.U. ....	20,000	20,000		20,000
B-complex supplement, lbs. <sup>2</sup> ....	2	2	2	2
D-L Methionine, lbs. ....	2	2		
Lysine (20% lysine), lbs. ....	2	2		
Aurofac 1.8-1.8, lbs. ....	6		6	6
Anreomycin, gms. ....		30		
Terramycin, gms. ....		10		
Bacitracin, gms. ....		10		
Penicillin, gms. ....		10		

1. All rations prepared by the Department of Flour and Feed Milling Industries.

2. All rations fed as 3/16-inch pellets.

3. Monek 58-A: 2.0 gms. riboflavin; 6.0 gms. niacin; 3.68 gms. D-pantothenic acid; and 20.0 gms. choline chloride per pound of supplement.

Table 25  
Data from comparisons of corn vs. sorghum, pellets vs. meal, and soybean oil meal vs. mixed protein for growing-finishing pigs.

Ration no. ....	30	31	32	33	34	35	36	37	39	40
Crude protein level, %	16.6	16.1	16.1	16.2	17.5	17.7	15.4	14.8	16.4	16.0
Pen no. ....	1	2	3	4	5	6	7	8	12	13
Grain Preparation	Corn Pellet	Corn Meal	Sorghum Meal	Sorghum Pellet	Corn Meal	Sorghum Meal	Corn Pellet	Sorghum Pellet	Sorghum Pellet	Sorghum Meal
No. of pigs	13 <sup>1</sup>	14	14	14	13 <sup>1</sup>	13 <sup>1</sup>	13 <sup>1</sup>	14	13 <sup>1</sup>	14
Av. on-test wt., lbs.	69	69	75	74	71	76	75	82	59	58
Av. off-test wt., lbs.	226	231	229	225	236	227	231	230	223	217
Av. days on test	79	85	81	77	79	80	74	73	81	88
Av. daily gain, lbs. ...	1.99	1.90	1.91	1.97	2.01	1.89	2.11	2.12	2.01	1.81
Standard error of mean	±0.04	±0.06	±0.05	±0.06	±0.06	±0.07	±0.08	±0.08	±0.04	±0.06
Av. feed efficiency, lbs.	326	353	363	326	330	341	311	302	333	351
Av. cost per cwt. gain	\$11.02	\$11.58	\$12.27	\$11.34	\$ 9.90	\$10.50	\$ 9.67	\$ 9.63	\$10.76	\$12.11
Feed cost per ton	67.60	65.60	67.60	69.60	60.00	61.60	62.20	63.80	71.00	69.00

1. One pig not used in calculating gain data.

**Table 26**  
Summary: pellets vs. meal for growing-finishing pigs.

Preparation .....	Pellet	Meal
Rations <sup>1</sup> .....	30, 33, 36, 37, 39	31, 32, 34, 35, 40
Pens .....	1, 4, 7, 8, 12	2, 3, 5, 6, 13
No. pigs .....	67	68
Av. on-test wt., lbs. ....	72	70
Av. off-test wt., lbs. ....	228	228
Av. days on test .....	77	83
Av. daily gain, lbs. ....	2.04	1.90
Av. feed efficiency, lbs. ....	314	348

1. See Table 24.

nozzles were used to cool the pigs in hot weather. No hedding was used. Floors were scraped clean daily but not washed.

All rations were prepared in the Department of Flour and Feed Milling Industries as needed. Rations were handled in 50-pound paper bags. Basic formulae of rations fed are listed in Table 24.

Individual animals were removed from test lots as they reached approximately 230 pounds.

**Table 27**  
Summary: corn grain vs. sorghum grain for growing-finishing pigs.

Grain .....	Corn	Sorghum
Rations <sup>1</sup> .....	30, 31, 34, 36	32, 33, 35, 37
Pens .....	1, 2, 5, 7	3, 4, 6, 8
No. pigs .....	53	55
Av. on-test wt., lbs. ....	71	77
Av. off-test wt., lbs. ....	231	229
Av. days on test .....	79	78
Av. daily gain, lbs. ....	2.00	1.97
Av. feed efficiency, lbs. ....	330	333

1. See Table 24.

#### Observations

Table 25 summarizes the average performance of pigs in each experimental lot. Per ton feed costs include \$3.60 for paper bags.

Pelleted rations are compared with meal rations in Table 26. Pigs eating completely pelleted rations gained somewhat faster than those eating similar rations in meal form. Average feed efficiency also favored the completely pelleted rations. Part of the difference in feed efficiency was due to an observable but unmeasurable difference in feed wastage. Pigs eating pelleted rations wasted very little, while those eating meal rations consistently wasted an unmeasurable amount. Design and adjustment features of the feeders did not entirely prevent feed waste when meal rations were fed.

**Table 28**

Summary: mixed proteins vs. soybean oil meal protein as supplemental protein sources for growing-finishing pigs.

Preparation .....	Mixed protein	Soybean oil meal
Rations <sup>1</sup> .....	30, 31, 32, 33	34, 35, 36, 37
Pens .....	1, 2, 3, 4	5, 6, 7, 8
No. pigs .....	55	53
Av. on-test wt., lbs. ....	72	76
Av. off-test wt., lbs. ....	228	232
Av. days on test .....	80	76
Av. daily gain, lbs. ....	1.94	2.03
Av. feed efficiency, lbs. ....	342	321

1. See Table 24.

Rations built around corn grain or sorghum grain are compared in Table 27. Under conditions of this study pigs eating either corn or sorghum grain made similar average daily gains and feed efficiencies during the growing-finishing period.

Table 28 summarizes results obtained when supplemental protein came either from soybean oil meal or from a combination of soybean oil meal and animal protein sources. Differences in average daily gain and average feed efficiency are small and not significant.

#### Kansas Swine Improvement Association Testing Station

B. A. Koch and W. A. Moyer<sup>1</sup>

The seventh group of pigs tested in the Kansas Swine Testing Station completed their test during the 1961-62 winter. The Animal Husbandry Department and the Extension Service cooperate in managing and supervising the station. All expenses incurred in testing are paid by breeders or producers who have pigs tested.

Production data on boars and barrows are collected while the animals are growing from 60 to 200 pounds bodyweight. All animals receive the same pelleted ration during the growing period. Boars meeting station requirements are sold at public auction. Barrows are slaughtered in the Animal Husbandry Department's meats laboratory where carcass information is collected.

Table 29 summarizes data collected during the 1961 summer test and the 1961-62 winter test. Table 30, taken from the M.S. thesis of Mr. Ju Tung Yu, animal husbandry department graduate student, summarizes results from three years of testing. Table 31 lists the basic ration being fed to pigs during the testing period.

A serious problem during the 1961-62 winter test was stomach ulcers in a number of pigs. Stomach ulcers are a problem throughout the Midwest swine-producing area. A number of experiment stations have formal projects to study stomach ulcers of swine. The Kansas State Veterinary School is studying the problem, with Dr. Embert Coles in charge.

For further information about the swine-testing program, contact your county agent, the Kansas Swine Improvement Association, The Extension Service, or the Department of Animal Husbandry. The last three are at K-State in Manhattan.

1. Extension swine specialist.

**Table 29**  
Swine testing results (1961-62).

	BOARS	
	Summer 1961	Winter 1961-62
No. completing test .....	71 (29 herds)	49 (23 herds)
Av. daily gain, lbs. ....	1.84 (2.29-1.52)	1.77 (2.44-1.50)
Av. backfat, in. ....	1.06 (1.48-0.64)	0.99 (1.14-0.70)
Av. efficiency, lbs. ....	2.72 (3.06-2.48)	2.96 (3.24-2.41)
Av. age at 200 lbs., days .....	146 (175-120)	154 (179-122)
Cost to breeder .....	\$50.00	\$58.00
Av. sale price .....	\$189.48 (\$440-\$40)	\$199.32 (\$330-\$60)
	BARROWS	
	Summer 1961	Winter 1961-62
No. slaughtered .....	43 (29 herds)	25 (23 herds)
Av. slaughter wt., lbs. ....	196 (208-188)	191 (208-178)
Av. age at 200 lbs., days .....	165 (194-145)	174 (208-150)
Av. carcass backfat, in. ....	1.47 (1.83-1.11)	1.38 (1.70-1.05)
Av. loin eye, sq. in. ....	3.66 (5.05-2.68)	3.92 (5.12-3.25)
Av. lean cuts, % .....	50.02 (55.5-46.2)	52.2 (55.4-46.5)
U.S.D.A. No. 1 .....	34 head	23
U.S.D.A. No. 2 .....	8 head	2
U.S.D.A. No. 3 .....	1 head	0