Pigs on concrete had approximately 15 square feet of floor space each while those on slats had approximately 8 square feet of floor space each. Both groups of pigs were self-fed complete meal ration number S-35. The ration formulation is listed in Table 23. Both groups drank from automatic water fountains and there was one mist-type fogging nozzle over each pen. Each pen was partially under roof.

Observations

Table 27 summarizes the average performance of pigs in each pen. Pigs on the slotted floor were always clean. All manure went through the floor and no cleaning was ever necessary. Pigs on the concrete floor were always dirty, even though the pen was scraped each day. The whole area was sprayed regularly to control flies.

During hot weather pigs on the slotted floor suffered noticeably from the heat and/or humidity. One pig became overheated and died August 6. Maximum temperature that day was 98° F. with high relative humidity. In contrast pigs on the wet, dirty floor showed little evidence of discomfort from heat even on the warmest days. Apparently the concrete floor helped cool the pigs.

Since feed efficiency figures are similar for the two groups, it is suggested that differences in weight gain were due to differences in feed intake due to temperature effect. It would be possible to overcome this effect in a properly designed slotted floor unit.

Table 27

Performance of pigs on a concrete floor vs. those on an elevated wooden, slotted floor.

June 7, 1962, to September 15, 1962—99 days.

	Concrete floor	Slotted floor
No. pigs	12	12[1]
Ration no.	S-35	S-35
Av. initial wt., lbs.	54	55
Av. final wt., lbs.	214	178
Av. daily gain, lbs.	1.61	1.28
Standard error	±0.04	±0.03
Av. feed eff., lbs.	3.30	3.35
Feed cost per cwt. gain	$10.06	$10.22

1. One pig died August 6. Post-mortem examination indicated heat prostration.

Corn vs. Sorghum and Pellets vs. Meal for Growing-finishing Swine (Project 110).

B. A. Koch

This is a continuation of feeding trials comparing the feeding value of corn and sorghum grain under Kansas conditions.

Experimental Procedure

Forty feeder pigs, 12 Poland Chinas and 28 Durocs averaging 55 pounds each, were randomly divided by breed and sex into four groups. All pigs had been previously vaccinated for cholera and erysipelas and wormed with piperazine.

The pigs were fed and housed on concrete where each pig had 18 square feet of space. There was an electrically heated, automatic waterer in each pen. Each group of 10 pigs had access to a three-hole fence line self-feeder.

Ration formulations are listed in Table 23. Rations 34 and 34A contained corn while 35 and 35A contained sorghum grain. Sorghum grain replaced corn on a pound-for-pound basis with no other changes in formulation. In each case one ration was fed as meal and one as pellets. Individual pigs were removed from test as they reached market weight. Carcasses were examined on the rail after slaughter.

Observations

Table 28 summarizes performance and cost data for the study. There was no significant difference between average daily gain figures for the various lots. In a previous study, pigs eating pelleted rations gained somewhat faster than those eating meal rations. The pigs eating the pelleted rations were more efficient than those eating meal. This was also true in a previous study.

Pigs performed as well on sorghum grain as on corn whether the ration was pelleted or in meal form. The corn and sorghum used in this study had similar protein levels, thus the change in grain did not change the crude protein level of the rations.

Under prices at the time of the study the sorghum grain rations produced cheaper gains than the corn rations. Pelleted rations produced gain more efficiently than meal rations in both comparisons even though the cost per ton of the pelleted rations was higher.

Carcasses from the various lots did not differ significantly in USDA grade.

Table 28

Corn vs. sorghum grain.

(Feeding period began December 16, 1961.)

Ration no.[1]	35	34	34A	35A
Av. % crude protein	16	16	16	16
Grain	Sorghum	Corn	Corn	Sorghum
Preparation	Meal	Meal	Pellet	Pellet
No. of pigs	10	10	10	10
Av. on-test wt., lbs.	52	54	56	56
Av. off-test wt., lbs.	215	206	222	220
Av. daily gain, lbs.	1.60	1.51	1.61	1.60
Standard error	±0.07	±0.07	±0.08	±0.07
Av. feed efficiency, lbs.	372	365	349	346
Av. feed cost per cwt. gain	$ 9.93	$10.73	$10.61	$ 9.58
Feed cost per ton	$53.40	$58.80	$60.80	$55.40

1. See Table 23 for ration formulation.

Swine Breeding Investigations (Project 242) (Progress Report).

B. A. Koch

A crossbred barrow sired by a Duroc boar (University Charm 16753), and out of a Poland China sow (Prince's Maiden 20-521492), was first place crossbred barrow at the 1962 Kansas State Fair. The barrow produced the champion carcass when slaughtered.

Carcass data follow:

Carcass length, 29.9 inches; backfat, 1.06 inches; loin eye area, 5.80 square inches; lean cuts, 53.67% of carcass weight and 39.1% of live weight.

Vitamin A Levels for Growing-finishing Pigs (Project 311).

B. A. Koch

Vitamin A supplementation recommendations vary considerably from station to station. Most research indicates that supplementation recommendations are generally much higher than actually necessary. This

study was designed to determine performance response to low-level vitamin A supplementation of an otherwise adequate diet.

Experimental Procedure

Twenty-five crossbred (Duroc x Poland China) feeder pigs were randomly divided into two groups. They had previously been vaccinated for cholera and erysipelas and treated for worms with piperazine.

The pigs were confined on concrete with water and feed before them at all times.

Ration formulations are listed in Table 23. One ration contained 100 I.U. of added vitamin A per pound and the other 400 I.U. Analysis of the rations indicated that essentially no vitamin A or provitamin A was coming from other sources.

Individual pigs were removed from the pens as they reached slaughter weight. Carcasses were evaluated on the rail after slaughter.

Observations

Increasing the vitamin A content of the diet from 100 to 400 I.U. per pound did not change the average daily gain or the feed efficiency of the pigs. Both groups did as well as similar pigs consuming diets with much higher vitamin A content. Carcasses from pigs receiving the lower level (100 I.U.) of vitamin A tended to carry more backfat than those from pigs on the higher level.

Stomachs were recovered at slaughter and examined by Dr. W. J. Griffing as part of a School of Veterinary Medicine study of stomach ulcers in swine. No difference in incidence or severity of ulcer symptoms was noted between the two groups.

Table 29
Vitamin A levels for growing-finishing pigs.
(Started on feed, December 16, 1961)

Ration no.	29-B	29-C
Av. % crude protein	15.8	15.8
I.U. vitamin A added/lb.	100	400
No. of pigs	12	13
Av. on-test wt., lbs.	52	49
Av. off-test wt., lbs.	223	211
Av. daily gain, lbs.	1.62	1.56
Standard error	±0.10	±0.08
Av. feed efficiency, lbs.	342	333
Av. feed cost per cwt. gain	$10.70	$10.42
Feed cost per ton	$62.60	$62.60

Arsanilic Acid in Growing-finishing Swine Rations (Project 110).

B. A. Koch and Tran Nam

Arsanilic acid is one of the many feed additives approved by the Food and Drug Administration for use in swine rations. Results from an uncontrolled feeding demonstration suggested that arsanilic acid effectively increased daily gain and improved feed efficiency. This study was designed to check further the value of dietary arsanilic acid.

Experimental Procedure

Thirty head of Poland China and Duroc weanling pigs were randomly divided by breed and sex into three groups and started on test, December 16, 1961. Before the trial started all pigs had been vaccinated for erysipelas and cholera and had been wormed with piperazine.

Two groups were closely confined on concrete; the third had access to winter rye pasture. Individual pigs were removed from test pens as they reached market weight.

Observations

Table 30 summarizes the performance of the three groups. There were no statistically significant differences in average daily gain. However, pigs fed in confinement and supplemented with arsanilic acid had the highest average daily gain. Pigs on rye pasture required the most feed per pound of gain. They spent considerable time on pasture, but still had the poorest feed efficiency of any group.

The rye pasture, an old hog pasture, apparently increased incidence of roundworms in that group of pigs. They threw more roundworms when all groups were treated with piperazine 60 days after going on test. They also walked more than the pigs in confinement pens.

Feed costs per 100 pounds of gain were highest on the rye pasture because of poorer feed efficiency. Although pigs receiving no arsanilic acid in confinement gained slightly less per day than confined pigs receiving arsanilic acid, highest efficiency and lowest cost per 100 pounds of gain were from nonarsanilic acid, confined pigs.

Table 30
Arsanilic acid in growing-finishing swine rations.
(Feeding period began December 16, 1961.)

No. of pigs	10	10	10
Ration no.[1]	33	44	44
Av. % crude protein	15	15	15
Arsanilic acid	No	Yes	Yes
Rye pasture	No	No	Yes
Av. on-test wt., lbs.	43	52	48
Av. off-test wt., lbs.	204	230	218
Av. daily gain, lbs.	1.56	1.73	1.51
Standard error	±0.07	±0.09	±0.10
Av. feed efficiency, lbs.	325	338	369
Av. feed cost per cwt. gain	$ 9.98	$10.44	$11.40
Feed cost per ton	$61.40	$61.81	$61.81

1. See Table 23 for ration composition.

Some Effects of Dietary Nitrate and Nitrite on Growing-finishing Pigs (Project 311).

Siripong Sukhonthasarnpa, D. B. Parrish and B. A. Koch

The presence of nitrates and nitrites in feed and drinking water of farm animals apparently has caused some serious nutritional problems. This study was to establish more clearly some ways the nitrites interfere with normal processes in the animal body.

Experimental Procedure and Observations

A pilot study using two pigs per treatment was initiated in June, 1962. Table 31 shows the general design of the study plus average results of data collected. Either sodium nitrate ($NaNO_3$) or sodium nitrite ($NaNo_2$) was mixed into the ration at the indicated level.

The pigs were fed on concrete from a self-feeder and were watered by hand. A fog nozzle was over each pen on the outside of the shed or shade areas. Blood samples were taken from the anterior vena cava area.

Results shown in Table 31 indicate that the two levels of dietary $NaNO_3$ caused an increase in the methemoglobin level of the blood, a decrease in serum vitamin A level and some decrease in growth rate.