Table 4

The Comparative Value of Corn, Open-pollinated Sorghum, and Hybrid Sorghum as Swine-fattening Feeds.

December 2, 1957, to March 20, 1958—107 days.

Ration fed	Whole hybrid sorghum, protein-mixed supplement	Rolled hybrid sorghum, protein-mixed supplement	Whole open-pollinated sorghum, protein-mixed supplement	Rolled open-pollinated sorghum, protein-mixed supplement	Shelled corn, protein-mixed supplement
Lot number	1	2	3	4	5
Number of pigs per lot	8	8	8	8	8
Av. initial wt. per pig, lbs.	52.40	52.60	52.50	52.40	52.80
Av. final wt. per pig, lbs.	176.22	180.41	198.62	199.42	175.43
Av. total gain per pig, lbs.	123.82	127.80	146.12	147.02	122.63
Av. daily gain per pig, lbs.	1.15	1.19	1.36	1.37	1.14
Av. daily ration per pig, lbs.:					
Grain	4.13	4.03	4.71	4.85	4.15
Protein supplement	.54	.54	.56	.53	.55
Av. lbs. feed per cwt. gain per pig:					
Grain	357.37	337.44	345.60	353.69	362.88
Protein supplement	48.05	45.48	41.14	39.19	48.51

Observations

Pigs in lots 3 and 4, those that received the open-pollinated sorghum, made the largest daily gains, 1.36 and 1.37 pounds, respectively. They also ate more feed per day. The amount of feed per 100 pounds gain was low. The sorghum fed in these lots was of excellent quality, clean, high protein and good plump grain, which probably accounts for its superiority in this experiment. The hybrid sorghum fed in lots 1 and 2 made gains a little better than the corn fed in lot 5. The hybrid sorghum was not of very good quality, was somewhat wet, and the grain was not too plump or clean.

All factors considered, the sorghums, both open-pollinated and hybrid, showed up well. This is consistent with other experiments where sorghum has been superior to corn for fattening hogs.

The Value of the Antibiotic B_{12} Supplement Terramycin Bi-Con TM-10 Vitamin B_2 Premix (Fortafeed 2-49-C), and Aureomycin B_{12} Supplement Aurofac 2A in the Protein Supplement for Fattening Spring Pigs in the Dry-Lot in Summer (Project 110, Test 3).

C. E. Aubel

In 1956-57 experiments with swine were designed to secure information on the maximum use of alfalfa meal in protein supplemental mixtures as a dry-lot substitute for pasture, since pastures for swine in Kansas are often poor, inadequate, or unavailable. The pigs in these tests received, with their grain, mixed protein supplements which contained varying quantities of alfalfa meal. The mixed protein supplement that gave best results for the two years tested was one of 4 parts tankage, 4 parts soybean meal, and 3 parts alfalfa meal.

From time to time there come on the market new substances, chemical and otherwise, that, added to a ration, increase gains and feed efficiency. To the efficient protein supplement of the two years preceding, antibiotics and a vitamin B_2 premix were added to see if the 4 parts tankage, 4 parts soybean meal, and 3 parts alfalfa meal protein mixture would then produce more efficient gains.

Acknowledgment is made to Chas. Pfizer & Co., Inc., Terre Haute, Ind., for supplying the Terramycin B_{12} Supplement, Bi-Con TM-10, for this experiment; and to the American Cyanamid Co., Lederle Laboratories Division, New York, for the Fortafeed 2-49-C and the Aurofac 2A.

In this test four lots of pigs were self-fed shelled corn and a mixed protein supplement. Each lot contained 10 pigs.

Lot 1 pigs were placed on alfalfa pasture and self-fed a protein supplement made up of 4 parts tankage, 4 parts soybean meal, 1 part cottonseed meal, and 1 part alfalfa meal.

Lot 2 pigs were treated exactly as those in lot 1, except that 4½ pounds of the antibiotic Terramycin Bi-Con TM-10 was added to each ton of the supplement.

Lot 3 pigs were fed in the dry-lot and received a mixed protein supplement of 4 parts tankage, 4 parts soybean meal, and 3 parts alfalfa meal.

Lot 4 was fed in the dry-lot and received the same protein supplement as lot 3 with 15 pounds of aureomycin B_{12} (Aurofac 2A) and 15 pounds of Fortafeed 2-49-C, a vitamin premix added per ton of protein mixture.

Table 5 gives the results of this experiment.

Table 5

The Value of Antibiotic Terramycin (Bi-Con TM-10), Vitamin B_2 Premix (Fortafeed 2-49-C) and Aureomycin B_{12} Supplement (Aurofac 2A) in the Protein Supplement for Fattening Spring Pigs in the Dry-Lot in Summer.

June 9, 1957, to September 17, 1957—100 days.

	Shelled corn, mixed protein supplement: 4 parts tankage, 4 parts soybean, 1 part cottonseed meal, 1 part alfalfa meal — alfalfa pasture — 4½ lbs. Bi-Con TM-10 Terramycin added per ton		Shelled corn, mixed protein supplement: 4 parts tankage, 4 parts soybean meal, 3 parts alfalfa meal — in dry-lot —	
				15 lbs. 2-49-C and 15 lbs. Aurofac 2A added per ton
Lot number	1	2	3	4
Number pigs in lot	10	10	8	10
Av. initial wt. per pig, lbs.	60.20	60.30	59.60	59.10
Av. final wt. per pig, lbs.	181.00	180.50	214.80	209.00
Av. total gain per pig, lbs.	119.80	120.20	155.20	149.90
Av. daily gain per pig, lbs.	1.19	1.20	1.55	1.49
Av. daily ration per pig, lbs:				
Shelled corn	3.85	3.87	4.51	4.56
Protein supplement	.37	.30	.54	.59
Lbs. feed per cwt. gain per pig:				
Shelled corn	321.70	322.79	290.35	304.20
Protein supplement	30.96	24.45	44.10	39.75

Observations

In this experiment the pigs in lots 1 and 2 fed on alfalfa pasture made almost exactly the same daily gains, 1.19 and 1.20 pounds each, respectively. The pigs in lot 3 and lot 4 fed in the dry-lot made larger gains and used less feed per 100 pounds gain than the pasture-fed pigs. In lot 3 the pigs were fed only the protein supplement, 4 parts tankage, 4 parts soybean meal, and 3 parts alfalfa meal, yet produced the largest gain of the lots. When supplements of Fortafeed 2-49-C and vitamin B_2 premix and an antibiotic aureomycin were fed in lot 4, the gains were not quite so good and neither was the feed conversion so efficient, yet it was satisfactory.

The pasture for the pigs in this experiment was not too good, which probably explains to some extent the poor showing of the pasture-fed lots 1 and 2.

On the whole, the results of this experiment confirm for the third year that increased alfalfa meal in the protein supplement increases efficiency in dry-lot feeding, and that we may expect the addition of an antibiotic and vitamin B_{12} supplements to make a good showing.

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

Provitamin A from Alfalfa and Yellow Corn, and Vitamin A in a Gelatin-Stabilized Product as Sources of Vitamin A for Weanling Pigs.

D. B. Parrish and C. E. Aubel

This test was made to obtain further information on the utilization of Vitamin A from different sources by weanling pigs. Sources of Vitamin A were: (1) a gelatin-stabilized vitamin A product, (2) carotene as supplied by a high-quality dehydrated alfalfa meal, and (3) carotene and cryptoxanthin as supplied by yellow corn. Units of vitamin A were calculated from the carotene and cryptoxanthin analyses by multiplying micrograms of these pigments by 1.6 and 0.8, respectively.

In the 1957 test a purified cryptoxanthin was separated and determined, but in the 1956 test a crude cryptoxanthin, which contained some pigment in addition to cryptoxanthin, was determined. In the 1957 test vitamin A or provitamin A was added to the feed at 500 units per pound, but in 1956 only 400 units per pound were used. Feed was prepared several times during the two months of the study so that no batch was more than 16 days old before it was consumed.

Twenty-seven weanling pigs from gilts fed a vitamin A-restricted diet during gestation and lactation were distributed into three groups of three lots each so that lots among groups were balanced on the basis of litter, sex and weight. Gilts and weanling pigs were in good condition at the time of weaning, but vitamin A reserves were low.

The basal feed was 78 percent white corn, 16 percent soybean oil meal, 2.5 percent non-fat dry milk solids, 1.3 percent brewer's yeast, 0.4 percent iodized salt, 0.4 percent bone meal, and 0.4 percent calcium carbonate, plus vitamins and trace minerals. The feed conversion ratios (Table 6) indicate that this was a good basal ration. When yellow corn or alfalfa was used as a source of vitamin A, it was substituted in the formula for an equal weight of white corn. Each day a quantity of feed was offered to each lot slightly in excess of that which would be consumed. The test was similar to the 1956 test, but modified slightly as noted previously.

Data from the 1957 test are presented in Table 6 and for comparison the 1956 data also are shown.

Observations

1. Growing pigs fed stabilized vitamin A had much higher levels of serum vitamin A than those receiving provitamin A from yellow corn or dehydrated alfalfa. Results in 1957 using 500 units of stabilized vitamin A per pound of feed were similar to those in 1956 when 400 units were used. Vitamin A levels in serum of pigs receiving dehydrated alfalfa were similar both years, but vitamin A levels in serum of pigs fed yellow corn were higher in 1957, indicating that the crude cryptoxanthin fraction of yellow corn contained some vitamin A inactive pigment or pigments of low vitamin A activity.

2. In the 1957 test, pigs getting provitamin A from dehydrated alfalfa gained almost as well as those getting stabilized vitamin A, but they did not do so well in the 1956 test.

3. Gains and feed conversions were somewhat better in the 1957 test than in 1956.

Table 6

Average Body Weights, Feed Conversion Ratios, and Blood Serum Vitamin A Contents of Pigs.

Diet	Lot[1]	Av. wt., lbs. Start	Av. wt., lbs. End 2 mos.	Average gain, lbs. By lot	Average gain, lbs. By diet	Feed conversion ratio By lot	Feed conversion ratio By diet	Vitamin A, mgs. per 100 ml. serum[2] By lot	Vitamin A, mgs. per 100 ml. serum[2] By diet
1957 Data									
Vitamin A[3]	1[4]	27	96	69		2.6		17.2	
	2	24	98	74		2.4		16.8	
	3	25	93	68	70	2.6	2.5	22.8	18.9
Dehydrated alfalfa	1a	27	94	67		2.6		2.5	
	2a	24	92	68		2.6		3.1	
	3a	24	92	68	68	2.6	2.6	2.9	2.8
Yellow corn	1b	27	91	64		2.8		4.3	
	2b	24	84	60		2.8		3.5	
	3b	25	82	57	60	3.0	2.9	3.2	3.7
1956 Data									
Vitamin A	1	23	92	69		2.7		21.6	
	2	25	95	70		2.6		22.2	
	3	25	87	62	67	2.9	2.7	17.9	20.6
Dehydrated alfalfa	1a	23	76	53		2.9		4.3	
	2a	25	87	62		2.8		3.1	
	3a	25	65	40	52	3.6	3.1	1.4	3.1
Yellow corn	1b	23	81	58		2.8		1.4	
	2b	25	89	64		2.9		1.3	
	3b	25	59	34	52	3.6	3.1	1.3	1.3

1. Three pigs per lot.
2. At end of test.
3. Gelatin-stabilized vitamin A was Pfizer A-10-P.
4. 1, 1a, 1b, etc., are groups balanced by litter, sex and age at start of test.