

self-feeder. The waterer and all feeders were under roof in an open-front shed. Each pig had approximately 30 square feet of floor area, two thirds of which was under roof.

The six preparations were (1) whole grain; (2) dry rolled grain; (3) dry rolled and pelleted grain; (4) steam rolled grain; (5) steam conditioned, rolled grain and (6) fine ground grain.

At the same time five groups of pigs were each given only one preparation throughout the growing-finishing period. Preparations used were the same as the first three above, a complete ration in meal form and a complete ration in pellet form. The pigs eating preparations (1), (2), and (3) ate protein supplement 49-A (see Table 18) free choice. The complete rations were 80 percent dry rolled sorghum grain and 20 percent protein supplement 49-A.

These pigs were housed in 7- x 28-foot pens with 16 feet under the roof of an open-front building. Water was available from automatic, electrically heated waterers. Each pen contained a three-hole, fence-line feeder. Pigs eating free choice had supplement available at one feeder opening and grain at the other two. Pigs eating a complete ration had the ration available at all three openings.

Observations

Results of the preference study are summarized in Table 26. The pigs definitely preferred whole grain or dry rolled pelleted grain over all other preparations, with no definite preference between the two preparations. They consumed very little of any of the other preparations.

Results of the performance part of the study are summarized in Table 27. Average daily gains of pigs eating various preparations did not differ significantly. The amount of grain required to produce 100 pounds of gain differed among the three groups on grain and supplement free

Table 26
Consumption of various sorghum grain preparations during a 118-day preference trial.

Preparation	Total lbs.	Days	Lbs. per day
Whole grain	2213	118	18.75
Dry rolled	7	118	0.06
Rolled and pelleted	2298	118	19.47
Steam rolled	8	118	0.07
Steam conditioned, rolled	12	118	0.10
Fine ground	9	118	0.07

Table 27
Performance of pigs limited to one sorghum grain preparation.

Ration preparation	No. of pigs	Av. gain, lbs. per day	Grain + supplement, lbs. per 100 lbs. gain	Feed cost 100 lbs. gain ²
Whole grain	10	1.43 ± .04 ¹	310 + 55	\$8.12
Dry rolled	10	1.50 ± .07	285 + 58	7.82
Rolled and pelleted	10	1.41 ± .10	273 + 56	7.51
Complete ration (meal) ³ ..	10	1.48 ± .08	298 + 72	8.95
Complete ration (pelleted) ³	10	1.53 ± .06	246 + 62	7.95

1. Ingredient and processing costs: sorghum grain, \$1.77 per cwt.; protein supplement, \$4.79 per cwt.; rolled grain, 20 cents per cwt.; pelleting, 10 cents per cwt.

2. Standard error of mean.

3. 80% dry rolled grain + 20% protein supplement.

choice. However, supplement intakes were very similar for the three groups. Pigs eating a complete ration were forced to eat a particular ratio of grain and supplement. Pigs eating a complete pelleted ration were much more efficient gainers than those eating a complete meal ration.

Kansas Swine Improvement Association Testing Station

B. A. Koch and W. A. Moyer

Eleven Kansas swine producers had 27 pens of barrows and gilts on test during the summer of 1963. It was necessary to send most of the pigs to Maurer-Neuer Meat Packers in Arkansas City for slaughter because our refrigeration facilities failed. Some carcass data were lost. Table 28 summarizes performance and carcass data collected.

Two litter-mate pigs were fed in each pen. The pigs received ration S-35-A (Table 18) throughout the testing period. Average testing cost per pig was \$29; average return per carcass, \$32. Sixteen of the 54 pigs that started on test met certification requirements.

Nine Kansas producers had 14 pens of barrows and gilts on test during the fall and winter of 1963-64. Another producer had a pen of 15 animals on test under the rules of the Superior Meat Sire (SMS) program. Tables 29 and 30 summarize performance and carcass data collected.

Two litter-mate pigs were fed in each pen as before. The pigs received rations S-35-D (Table 18). Average testing cost per pig was \$35; average return per carcass, \$32. Ten of the 20 pigs in the 14 test pens and 9 of those in the SMS pen met or exceeded purebred breed association certification standards.

Table 28
Kansas Swine Testing Station—Summer 1963.

Breeder	Sex ¹	B ²	PRODUCTION DATA ³			CARCASS DATA ⁴				Index	
			Age at 200 lbs. (days)	A.D.G., lbs.	Feed eff., lbs.	Lgth., in.	R.F., in.	L.P., sq. in.	% L.C.		
Vern Albrecht Smith Center	B	D	142	1.82	287	29.0	1.33	4.16	54.4		
	B	D	Died on test								
Vern Albrecht Smith Center	B	D	148	1.91	302	29.0	1.73	3.43	50.5		
	B	D	149	2.00		29.0	1.70	3.72	50.3		
Bathrop Farm	G	H	184	1.16	283	30.0	0.97	4.67	57.7	96.70	
Webbia	B	H	155	1.71		30.5	1.07	5.42	56.6		
Bathrop Farm	G	H	Died on test								
Webbia	B	H	158	1.60	284	29.5	1.33	4.40	57.2		
J. V. Cundiff	G	S	148	1.76	316	Lost in transit					
Talmage	B	S	160	1.67		29.5	1.30	4.12	56.9		
J. V. Cundiff	G	S	147	1.97	276	30.5	1.16	3.71	55.7		
Talmage	B	S	158	1.74		29.0	1.20	4.00	55.7		
Animal Husbandry KSU, Manhattan	G	D	158	1.85	289	29.5	1.23	3.37	51.9		
	B	D	134	2.07		29.0	1.67	2.91	50.6		
Animal Husbandry KSU, Manhattan	G	PC	188	1.25	309	28.8	1.08	4.95	56.0	86.5	
	B	PC	164	1.83		Lost in transit					
John Musiek, Jr.	B	H	150	1.80	288	30.5	0.93	4.13	59.5		
Route #5, Lawrence	B	H	184	1.50		Lost in transit					
John Musiek, Jr.	B	H	174	1.50	313	30.0	1.17	4.60	55.1		
Route #5, Lawrence	G	H	183	1.51		30.5	1.03	4.50	57.8		
John Musiek, Jr.	G	H	161	1.64	309	Lost in transit					
Route #5, Lawrence	B	H	172	1.52		29.0	1.17	5.02	56.5		
O'Bryan Ranch	G	H	174	1.61	329	31.0	0.83	4.44	59.8		
Hiattville	G	H	Died on test								
O'Bryan Ranch	G	H	150	1.89	273	30.5	0.90	4.82	55.9		
Hiattville	G	H	157	1.75		Lost in transit					
O'Bryan Ranch	G	H	196	1.05	328	29.1	0.95	4.98	60.7	99.8	
Hiattville	B	H	147	1.68		30.0	1.20	4.41	56.5		
Sandy Knoll Farm	G	D	148	1.94	273	Lost in transit					
Leon L. Dunn, St. John	B	D	162	1.57		29.0	1.17	3.40	54.9		
Melvin Shipley	B	H	169	1.44	284	Lost in transit					
Esbon	B	H	154	1.75		Lost in transit					
Melvin Shipley	B	H	171	1.48	318	Lost in transit					
Esbon	G	H	170	1.53		Lost in transit					
Wilbur Talkington	B	D	148	1.94	283	28.0	1.40	3.87	53.0	74.7	
Matfield Green	B	D	147	2.02		28.5	1.18	3.70	53.3	68.0	
Wilbur Talkington	G	D	130	1.80	285	29.5	1.10	4.12	57.6		
Matfield Green	B	D	150	1.87		30.0	1.40	4.03	56.3		
Loren Thiele	G	H	191	1.37	317	30.9	1.22	5.04	56.9	101.4	
Route #2, Norton	B	H	180	1.55		29.5	1.27	4.97	55.1		
Loren Thiele	B	H	202	1.64	296	30.0	1.23	4.35	57.5		
Route #2, Norton	B	H	218	1.32		29.3	1.12	4.29	56.5	93.9	
Neill Walker	B	Y	128	2.00	250	30.5	1.53	4.71	57.9		
McPherson	B	Y	130	2.03		29.5	1.40	4.34	56.9		
Neill Walker	G	Y	166	1.56	284	30.5	1.37	4.61	57.1		
McPherson	B	Y	136	2.14		29.5	1.30	4.45	54.6		
Neill Walker	G	Y	139	1.87	267	30.5	1.50	5.36	56.5		
McPherson	B	Y	137	1.92		31.0	1.63	4.40	52.1		
Neill Walker	G	Y	154	1.64	285	Lost in transit					
McPherson	B	Y	148	1.82		Lost in transit					
Neill Walker	G	Y	151	1.86	262	31.0	1.35	5.47	55.4	101.7 ²	
McPherson	B	Y	137	2.08		30.0	1.33	4.03	55.2		
Neill Walker	B	Y	136	2.20	250	30.5	1.63	4.57	53.3	85.7	
McPherson	B	Y	135	2.05		31.1	1.48	4.49	55.1	93.9	

1. B = breed; A.D.G. = average daily gain; feed efficiency = an average for two pigs fed together.

2. Lgth. = carcass length; R.F. = average carcass backfat; L.P. = loin eye area; % lean cuts = carcass weight basis; Index = index according to 1962 National Barrow Show Index (a pig with 6.0 sq. in. of loin eye and 13% of live weight in trimmed ham indexes 100.0).

3. Highest indexing carcasses that meets or exceeds all certification requirements.

4. Sex — B = barrow; G = gilt.

5. B = breed; D = Duroc; H = Hampshire; S = Spot; PC = Poland China; Y = Yorkshire.

Table 29
Kansas Swine Testing Station—Winter 1963.

Breeder	PRODUCTION DATA ¹				CARCASS DATA ²					
	Sex ³	B ⁴	Age at 200 lbs. (days)	A.D.G., lb.	Feed eff., lb.	Lgth., in.	R.F., in.	L.E., sq. in.	% L.C.	Index
Dale S. Galle & Son	G	X	163	1.53	335	29.5	1.42	4.25	49.2	81
Moundridge	B	X	143	1.96		30.0	1.65	3.88	48.5	79
Dale S. Galle & Son	G	D	144	1.83	333	29.0	1.67	3.72	50.9	81
Moundridge	B	D	142	1.93		29.1	1.48	3.18	48.6	68
Wilbur Talkington	G	D	145	1.71	354	28.0	1.53	3.53	48.4	78
Matfield Green	B	D	180	1.19		27.3	1.21	4.11	55.9	93
Neill Walker	G	Y	160	1.51	356	29.5	1.40	4.04	50.2	71
McPherson	G	Y	148	1.65		29.8	1.20	4.41	52.5	88
Wallace Wolf	B	Y	139	2.16	291	30.1	1.52	3.64	51.9	73
South Haven	B	Y	144	2.07		29.1	1.58	4.37	52.0	82
Wallace Wolf	B	Y	155	1.88	329	27.8	1.43	4.83	52.8	83
South Haven	B	Y	180	1.56		28.9	1.28	3.80	56.3	92
Velsa Hall	B	Y	142	2.10	288	29.4	1.50	4.44	52.4	79
South Haven	B	Y	147	1.70		28.7	1.33	4.88	51.8	94
Neill Walker	G	Y	Died on test							
McPherson	B	Y	Died on test							
Loren Thiele	G	H	170	1.51	314	29.5	1.10	4.19	57.6	107
Norton	B	H	159	1.73		28.8	1.15	4.25	54.2	88
Loren Thiele	B	H	165	1.58	306	29.1	.98	5.20	59.4	122 ¹
Norton	G	H	161	1.68		29.7	1.32	5.32	57.5	108
Melvin Shipley	B	H	159	1.75	320	28.9	1.49	4.13	53.6	83
Esbon	B	H	160	1.80		27.7	1.30	4.97	55.9	111
Kansas State Univ.	B	PC	165	1.51	304	27.5	1.17	5.45	59.7	123
Manhattan	B	PC	160	1.51		28.2	1.13	4.64	53.6	93
Kansas State Univ.	B	D	162	1.48	361	27.9	1.48	3.50	49.9	68
Manhattan	B	D	163	1.65		28.4	.97	3.78	54.0	88
Joe O'Bryan	B	H	135	2.05	329	29.4	1.38	4.36	51.9	83
Hiattville	G	H	169	1.52		29.0	1.15	4.25	55.8	94
Average			156	1.71	325	28.9	1.34	4.27	53.4	89

1. B = Breed; A.D.G. = average daily gain; feed efficiency = an average for two pigs fed together.

2. Lgth. = carcass length; R.F. = average carcass backfat; L.E. = loin eye area; % L.C. = percent lean cuts on carcass weight basis; Index = index according to 1963 National Barrow Show Index (a pig with 3.0 sq. in. of loin eye and 15% of live weight in trimmed ham indexes 100.0).

3. Highest indexing carcass that meets or exceeds all certification requirements.

4. Sex → B = barrow; G = gilt.

5. B = breed; X = crossbred; D = Duroc; Y = Yorkshire; H = Hampshire; PC = Poland China.

Table 30
Superior Meat Sire Test Pen—Winter 1962.

Breeder	Sex ¹	B ²	PRODUCTION DATA					Lph. in.	R.F. 20.	L.F. 52.3n.
			Age at 200 lbs. (days)	A.P.G. lbs.	Feed eff., lbs.	Age in.	R.F. 20.			
Bathrop Farm ³	B	H	168	1.56	314	29.0	1.33	4.38		
Wichita	B	H	176	1.36	314	29.5	1.32	4.47		
		H	168	1.53		29.5	1.47	4.56		
	B	H	165	1.56	314	29.0	1.60	4.72		
		H	509	.38 ⁴			
	B	H	169	1.50	314	29.0	1.50	3.80		
		H	177	1.31		28.0	1.93	3.82		
	G	H	167	1.43	314	29.0	1.16	5.07		
		H	165	1.41		29.0	1.08	4.82		
	G	H	161	1.54	314	29.0	1.37	4.76		
		H	167	1.29		29.5	1.34	4.22		
B	H	158	1.65	314	30.0	1.57	3.95			
	H	172	1.40		25.5	1.07	3.84			
B	H	166	1.46	314	30.0	1.49	3.83			
	G	174	1.43		26.5	1.17	4.05			
Average			158	1.47	314	29.2	1.31	4.31		

1. Sire of pigs—Arnold 54251.
2. Data not used to calculate average.
3. Sire—B = borrow; G = gift.
4. B = breed; H = Hampshire.

Beef Cattle

Vitamin A and Dehydrated Alfalfa Fed Individually and in Combination with and without Aureomycin in a Steer Fattening Ration (Project 567).

D. Richardson and E. F. Smith

This was the second test to compare dehydrated alfalfa as a source of vitamin A with pre-formed vitamin A, fed individually and in combination with and without Aureomycin. Two-year-old Hereford steers from two previous bluestem pasture-grazing tests were used in this test. They were from the same group as the yearlings used in the previous test. After the grazing test was completed, the steers were assigned to six lots of nine animals each on the basis of weight and uniformity. Supplements supplied the same amount of protein, calcium and phosphorus in each lot. Vitamin A value of carotene figuring dehydrated alfalfa at 400 I.U. per milligram of carotene gave 10,000 to 12,000 I.U. of vitamin A per head daily for animals receiving dehydrated alfalfa. Pre-formed vitamin A was added to the supplement at the rate of 15,000 I.U. per head daily. Assay of the supplements indicated approximately 30 percent loss. Aureomycin was fed at the rate of 70 mgs. per head daily. After the steers were on full feed, silage was limited to 20 pounds per head daily. The carotene content of the silage averaged about 2 mgs. per pound. All the sorghum grain was fed that the steers would clean up.

Results and Observations

The results are shown in Table 31. In general, the results agree with those of the previous test.

1. There were no differences in performance between animals fed dehydrated alfalfa and those fed pre-formed vitamin A.

2. A combination of pre-formed vitamin A and carotene was no better than either alone. Thus, it is indicated that a ration containing sufficient pre-vitamin A (carotene) is not benefited by adding pre-formed vitamin A.

3. Animals receiving a combination of added carotene, vitamin A and Aureomycin gained significantly faster than other lots in both tests; however, this was the only Aureomycin lot that gained faster. No explanation seems apparent.

4. No deficiency symptoms or difference in appearance was observed that could be attributed to vitamin A.

5. Again, liver storage of vitamin A was highest in animals fed pre-formed vitamin A, with greater variations within treatments than between treatments.

6. There was no real relationship between liver vitamin A storage and rate of gain, but animals with less liver storage tended to gain fastest.

7. There were no significant differences in percentage shrink to market, dressing percentage, carcass grades or carcass characteristics.