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Corn or Sorghum Grain in Growing-Finishing Rations (With and Without Added Copper, Vitamin E, Biotin or Aureo SP-250)

B. A. Koch and R. H. Hines

Summary

Pigs fed corn gained faster than those fed sorghum grain in one trial. The reverse was true in a second trial. Overall average daily gain figures were almost identical (1.67 lbs. per day for corn; 1.65 lbs. per day for sorghum). Average feed efficiency favored corn slightly (3.03 to 3.10). Adding 250 ppm copper to the diet significantly increased weight gain in one of five trials. Adding either vitamin E, biotin, or Aureo SP-250 did not significantly increase average daily gain or improve feed efficiency. Barrows gained 15% faster than gilts. Crossbred pigs gained 8% faster than the average of all purebreds.

Procedure

Trial 1 included 160 pigs (48 barrows and 112 gilts), (Yorks, Hamps, Durocs and Crossbreds) averaging 80 pounds each. Each was assigned to one of 16 similar groups. Breed, sex, and weight were considered in grouping the pigs. Each group consumed a pelleted ration from a two-hole self-feeder. Trial 2 included 120 pigs similar in breeding and weight to those in trial 1. One treatment (sorghum grain plus copper and vitamin E) was eliminated in trial 2.

Pigs were housed in the K-State growing-finishing barn. Propane-burning catalytic heaters (one over each pen) were used to maintain temperature above 50°F. There were a two-hole self-feeder and an automatic waterer in each pen. Ration premixes were prepared in the Grain Science and Industry Department. Mixing and pelleting was by a local commerical mill. Ration composition is shown in table 18.

Trial 1 started October 24, 1969, and the pigs were fed to an average weight of 205 pounds (approximately 79 days). Trial 2 started December 23, 1969, and the pigs were fed 72 days to approximately 201 pounds).

Results and Discussion

The performance data from 280 pigs in two separate trials are summarized in table 20.

In trial 1, no differences in average daily gain were significant. Trial 2 produced significant differences. Pigs receiving corn plus copper gained significantly faster than the other groups, but that was the

Table 18. Basal Ration Plus Indicated Additives

Ingredient	Pounds per ton of ration
Ground yellow corn or sorghum grain	1638
Soybean meal (50% crude protein)	300
Ground limestone	15
Dicalcium phosphate	17
Salt	10
Vitamin-trace mineral premix[1,2,3,4,5]	20

[1] 20 pounds of basic vitamin-trace mineral premix contained 3,000,000 I.U. vitamin A; 300,000 I.U. vitamin D; 1,000 mg. riboflavin; 5,000 mg. pantothenic acid; 15,000 mg. niacin; 100,000 mg. choline; 16 mg. vitamin B_{12}; 100 ppm zinc; 50 ppm iron; 27 ppm manganese; 5 ppm copper; 0.5 ppm cobalt and 0.75 ppm iodine.

[2] 890 gms. $CuSO_4 \cdot 5H_2O$ added to each ton of ration (equivalent to 250 ppm copper).

[3] 91 grams of vitamin E supplement containing 100,000 I.U. of vitamin E activity per pound added to each ton of ration (equivalent to 10 I.U. per pound of feed).

[4] 200 milligrams of biotin added to each ton of ration (equivalent to 100 mcg. per pound of feed).

[5] 5 pounds of Aureo SP-250 supplement added to each ton of ration (equivalent to 50 mgs. aureomycin, 50 mgs. sulfmethazine and 25 mgs. penicillin per pound of feed).

Table 19. Analyses of Rations Fed

Ration variable	Crude prot. %	Ether ext. %	Crude fiber %	Total ash %	Calcium %	Phosphorous %	Copper P.P.M.
Corn control	14.6	2.80	2.38	3.87	0.53	0.52	21
Corn + cu	14.8	2.40	2.32	3.76	0.48	0.48	199
Sorg. control	14.7	2.17	2.34	4.14	0.55	0.49	16
Sorg. + cu	14.9	1.96	2.02	3.88	0.51	0.49	182
Sorg. + vit. E	14.6	1.89	2.08	4.09	0.56	0.50	16
Sorg. + cu + vit. E	15.2	1.91	2.10	4.19	0.49	0.49	193
Sorg. + biotin	14.8	1.82	2.12	3.95	0.50	0.45	15
Sorg. + aureo SP-250	14.8	1.77	2.06	3.86	0.47	0.47	16

Table 20. Performance of Growing-finishing Pigs

Ration no.	Dietary variable	Av. daily gain, lbs Trial 1	Av. daily gain, lbs Trial 2	Avg. feed efficiency, lbs.[1] Trial 1	Avg. feed efficiency, lbs.[1] Trial 2
S-416	Corn control	1.59	1.73	3.12	3.10
S-416A	Corn + cu	1.58	1.81	2.97	2.99
S-417	Sorg. control	1.73	1.61	3.19	3.20
S-417A	Sorg. + cu	1.59	1.68	3.02	3.18
S-417B	Sorg. + vit. E	1.62	1.64	3.22	3.06
S-417C	sorg. + cu + vit. E	1.61	----	2.99	----
S-417D	Sorg. + biotin	1.53	1.66	3.22	3.00
S-417E	Sorg. + Aureo SP-250	1.66	----	3.22	----

[1] Pounds of feed required to produce one pound gain

only group that supplemental copper apparently helped.

Substituting corn for sorghum grain on a pound-for-pound basis resulted in no significant changes in average daily gain or feed efficiency. Differences between treatment groups were small.

Barrows gained significantly faster than gilts in both trials (11% faster in one and 15% faster in the other). Crossbred pigs gained significantly faster than purebreds in both trials (7½% faster in one and 8% faster in the other).