1960

Corn and Grain Sorghum Rations with Various Protein Supplements

Richard C. Wahlstrom
South Dakota State University

Robert W. Seerley
South Dakota State University

Gerald E. Poley
South Dakota State University

SOUTH DAKOTA STATE COLLEGE
Animal Husbandry Department Brookings, South Dakota
Agricultural Experiment Station

A. H. Swine 7
November, 1960

CORN AND GRAIN SORGHUM RATIONS WITH VARIOUS PROTEIN SUPPLEMENTS

Richard C. Wahlstrom, Robert W. Seerley and Gerald E. Poley

Grain sorghums are being grown more extensively in many parts of South Dakota. The increased use of grain sorghum has been brought about by the development of early maturing, high yielding sorghum varieties.

The following experiment was conducted to study the relative values of ground yellow corn and grain sorghums and also to study the value of various protein supplements.

Experimental Plan

Seventy-two purebred and crossbred pigs were divided into twelve lots. The pigs were allotted according to litter and weight and placed on concrete dry lots with free access to feed. The composition of the rations is given in table 1.

Table 1. Percentage Composition of Rations

			Weaning to 100 lbs.			
Lot No.	1	2	3	4[b]	5	6
Ground yellow corn	82.1	86.0	--	--	--	--
Ground sorghum	--	--	86.3	86.3	82.1	90.2
Soybean meal	15.5	6.5	11.3	11.3	15.5	4.4
Tankage	--	6.4	--	--	--	4.4
Dicalcium phosphate	0.8	0.2	0.8	0.8	0.8	0.3
Limestone	0.9	0.3	0.9	0.9	0.9	0.5
Trace mineral salt	0.5	0.5	0.5	0.5	0.5	0.5
Vitamin-antibiotic[a]	0.2	0.2	0.2	0.2	0.2	0.2
Crude protein content, %[c]	15.28	15.10	14.22	14.72	15.78	--
			100 to Market Weight			
Ground yellow corn	88.0	90.9	--	--	--	--
Ground sorghum	--	--	93.6	93.6	88.0	94.8
Soybean meal	9.5	3.7	4.0	4.0	9.5	1.6
Tankage	--	3.7	--	--	--	1.6
Dicalcium phosphate	0.8	0.3	0.7	0.7	0.8	0.5
Limestone	1.0	0.7	1.0	1.0	1.0	0.8
Trace mineral salt	0.5	0.5	0.5	0.5	0.5	0.5
Vitamin-antibiotic[a]	0.2	0.2	0.2	0.2	0.2	0.2
Crude protein content, %[c]	12.38	12.10	12.07	11.79	13.91	11.82

[a] Furnished 2 mg. riboflavin, 4 mg. pantothenic acid, 9 mg. niacin, 10 mcg. choline and 10 mg. antibiotics per pound of ration.
[b] L-lysine added at 0.1%.
[c] By analysis.

Summary of Results

The results of these studies are presented in table 2. Pigs fed rations which contained corn as compared with sorghums with protein supplements of either soybean meal or soybean meal-tankage produced the faster rate of gain and best feed conversion. Although the gains and feed conversion of the lots fed corn and soybean-tankage were somewhat poorer than the corn-soybean meal ration during the first period (to 100 lb.), this difference failed to show up at the end of the experiment. It might be noted that the ration containing tankage even produced slightly greater gains over the whole experiment. No improvement was noted when the animal protein was added to the sorghum rations (lots 3, 5 vs. 6).

When sorghum replaced corn in the ration on a pound for pound basis (lots 1 vs. 5) average daily gains were reduced 17 per cent and feed conversion reduced 11 per cent as these lots gained from weanling to 100 pounds. Similar results were shown for the last period.

In lot 3 the soybean meal content of the ration was lowered so that the crude protein levels of lots 1 and 3 would be nearly equal. With crude protein levels of the sorghum and corn nearly equal, the gains in the sorghum lots were 11 and 16 per cent less for the first period and entire experiment respectively. Feed conversion was 9 and 14 per cent poorer during the first period and entire experiment respectively for these same sorghum rations. By comparing lots 2 and 3 with lot 6 it can be seen that the corn ration (lot 2) produced 6 per cent faster gains and 11 per cent better feed efficiency than did the sorghum ration (lot 6) of comparable protein content. The only difference found between lots 3 and 6 was a slightly better feed efficiency obtained with lot 3 during the first period as is shown in table 2.

L-lysine was added at the .1% level to the sorghum ration fed lot 4. In comparing lot 4 with lot 3, which received the same ration as lot 4 except for the added lysine, the only differences were slightly better gains and feed efficiency in favor of the lysine lots.

Table 2. Results

Lot	1	2	3	4	5	6
Type of diet	Corn-Soybean	Corn-Soy-Tankage	Sorghum-Soy	Sorghum-Soy + 0.1% Lysine	Sorghum-Soy	Gr. Sorghum-Soy-Tankage
No. of pigs	12	12	12	12	11[a]	12
Av. initial wt., lb.	30.1	30.1	30.0	29.9	29.3	30.0
Av. final wt., lb.	204.6	209.2	200.2	201.6	176.4	173.4
Total no. days on test	107	108	124	124	113	113
Av. daily gain, lb.						
First period (to 100 lb.)	1.42	1.36	1.26	1.32	1.18	1.28
Entire experiment	1.63	1.70	1.37	1.38	1.30	1.27
Av. daily feed, lb.[b]	5.31	5.58	5.22	5.12	4.43	4.62
Av. feed per lb. gain, lb.						
First period (to 100 lb.)	2.87	2.94	3.15	3.16	3.24	3.32
Entire experiment	3.26	3.28	3.81	3.71	3.41	3.64

[a] One pig removed.

[b] Entire experiment.