A Comparison of Different Methods of Getting Cattle on a High Grain Ration and the Value of Prairie Hay in Finishing Rations.

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Cottonseed hulls have been used extensively in cattle rations as a source of roughage; the content in the ration is usually gradually lowered until the desired amount of concentrate is being consumed. In this study wheat bran was compared with cottonseed hulls for roughage. Since the question whether either feed was necessary arose, a third treatment was added where the heifers were turned directly on a self-feeder filled with a concentrate mixture containing 92% rolled sorghum grain; prairie hay was available for those turned directly on the self-feeder, in addition to the concentrate mixture in the self-feeder.

Under all three treatments, cottonseed hulls, wheat bran and turning on rolled sorghum grain directly, there were two lots of 10 heifers each. One lot was fed prairie hay and the other, no hay. All heifers going directly on feed received hay initially which was gradually eliminated (about 4 weeks) in one of the lots.

The heifers used were good to choice grade yearling Herefords that had been wintered on silage and prairie hay; some had received a small amount of grain; they were equally divided among treatments. For 6 weeks before the test, all heifers were on a ration of prairie hay, 4 pounds of ground corn and 1.25 pounds of soybean oil meal per head daily.

The wheat bran used had been pelleted (3/16 inch in diameter). It was then run through a roller to break it to several pieces and is referred to as wheat bran crumbles.

All the rations fed contained 11% or more protein and were formulated as nearly as possible to meet all the nutrient requirements for finishing heifers. With the cottonseed hull ration it was necessary to add soybean oil meal and urea to build the protein to the required level.

A 1000-pound mix of each one of the rations listed in Table 25 was prepared. When nearly all of the first 1000 pounds was consumed, for example wheat bran crumbles (W1), the next 1000 pounds (W2) were put in the self-feeder. When all four formulations had been placed in the feeder (W1, W2, W3, W4), it was filled with rolled sorghum grain ration (R1). Eventually, after the last lot had consumed its 4000 pounds of starter ration, all lots (wheat bran crumble lots and cottonseed hull lots) were on the same ration, R1, Table 25, as were the two lots of heifers that started on that ration (R1).

Prairie hay, when fed, was in amounts the heifers would clean up. After about 2 weeks, that was about 2 pounds per heifer daily.

The experimental treatments were:

Lot 18—Self-fed a ration made up initially of 50% wheat bran crumbles (Table 25, ration W1) and gradually reduced in wheat bran until it was omitted entirely. About as much hay was fed as the heifers desired.

Lot 23—Same as Lot 18, except no hay was fed.

Lot 20—Self-fed a ration made up initially of 40% cottonseed hulls (Table 25, ration C1) and gradually reduced in hulls until they were omitted entirely. About as much prairie hay was fed as the heifers desired.

Lot 19—Same as Lot 20 except no hay was fed.

Lot 22—Started on a rolled sorghum grain ration (ration R1 in Table 25) at the same time the other lots were introduced to their starter ration of bran or hulls. Prairie hay was available at all times.

Lot 21—Same as Lot 22, except the hay was gradually reduced until no hay was fed after about 4 weeks.

No digestive disturbances were observed among any animals except in Lot 20, a lot receiving cottonseed hulls and hay. About the time their last ration containing hulls (C4) was replaced with the rolled sorghum grain ration (R1), their droppings became loose and they went "off feed." No heifers foundered, at least none severely enough to be noticed

Table 25
Composition of rations.

Ration no.	Each of the rations below was self-fed about 5 to 6 days, gradually decreasing the bran or hulls and finally switching to the rolled sorghum grain ration (R1).									This ration self-fed Lots 21 and 22 after test and all other lots after about first 3 weeks.
	This ration fed to Lots 18 and 23 — Wheat bran crumbles				This ration fed to Lots 19 and 20 — Cottonseed Hulls				Rolled sorghum grain
	W1	W2	W3	W4	C1	C2	C3	C4	R1
Composition, %:									
Wheat bran crumbles	50.00	40.00	20.00	10.00	....	....	....	....	
Cottonseed hulls	....	....	....	....	40.00	30.00	15.00	7.50	
Rolled sorghum grain	39.50	49.50	69.50	83.00	40.75	53.25	70.25	83.00	92.00
Dehydrated alfalfa meal	10.00	10.00	10.00	5.00	10.00	10.00	10.00	5.00	5.00
Soybean oil meal	....	....	....	....	7.50	6.00	3.00	2.50	1.00
Urea	....	....	....	1.00	1.00	1.00	1.00	1.00	1.00
Ground limestone	....	....	....	0.50	0.35	0.25	0.25	0.50	0.50
Salt	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Trace mineral[1] Aureomycin[2] Diethylstilbestrol[3] Vitamin A[4]	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

1. Trace mineral premix supplied by Calcium Carbonate Co., Chicago, Ill.
2. Aureomycin supplied by American Cyanamid Co. and fed at rate of 4 mgs. per lb. of ration.
3. Diethylstilbestrol mixed to supply 0.5 mg. per lb. of feed.
4. Vitamin A added to supply 750 I.U. per lb. of feed.

Table 26
Methods of getting cattle on a high grain ration, May 6 to October 2, 1964—149 days.

Experimental treatment	First lots were self-fed either bran or hull rations listed in Table 25 for about the first 3 weeks or until bran or hulls were eliminated, then they were self-fed the rolled sorghum grain ration (R1) for the remainder of the test				Self-fed rolled sorghum grain ration R1 (see Table 25) entire test	
	Self-fed wheat bran ensemble rations initially		Self-fed cottonseed hull rations initially			
	Fed hay	No hay	Fed hay	No hay	Fed hay	No hay[1]
Lot no.	18	23	20	19	22	21
No. of heifers per lot	10	10	10	10	10	10
Initial wt. per heifer, lbs.	632	615	600	620	622	618
Performance first 19 days on test, lbs.:						
Daily gain	2.89	2.32	2.32	3.00	2.79	2.53
Concentrate mixture consumed per head daily	17.5	15.9	20.3	20.9	7.5	8.5
Prairie hay consumed per head daily	5.0		4.3		4.2	4.0[1]
Final wt. per heifer	955	873	931	971	939	948
Av. daily gain, entire test	2.16	2.40	2.21	2.36	2.11	2.22
Feed consumption per heifer daily, lbs:						
Concentrate mixture	17.4	17.9	19.0	17.8	17.1	16.5
Prairie hay	2.4		2.3		2.3	0.7[1]
Total feed	19.8	17.9	21.3	17.8	19.4	17.2
Feed per lb. of gain, lbs.	9.16	7.45	9.59	7.56	9.14	7.74
Feed cost per cwt. gain[2]	$16.80	$15.43	$17.89	$15.74	$16.69	$15.34
Carcass data:						
Carcass grade score[3]	18.7	18.0	19.1	20.0	19.5	19.2
Marbling score[4]	6.3	6.4	6.0	5.6	5.8	5.9
Rib-eye size, sq. in.	10.7	11.1	10.6	10.9	10.4	10.3
Fat thickness, in.	.9	1.0	1.0	1.0	1.1	1.1

1. Prairie hay was fed to Lot 21 only the first 31 days on test.
2. Cost per ton of ration delivered: wheat bran, $43.30; cottonseed hulls, $44.29; sorghum grain, $41.19.
3. Carcass grade score: 18high good, 18; low choice, 19; av. choice, 20.
4. Marbling score: Lower score indicates greater degree of marbling.

in the lots. When the heifers were driven to the scales each 28 days to be weighed, two in Lot 22 that were placed directly on the sorghum grain ration seemed to be slightly sore footed during the latter part of the test. They may have experienced slight founder.

The cottonseed hull lots were changed from their last hull ration (C4, Table 25) to the rolled sorghum grain ration (R1, Table 25) after about 20 days on test, and at about 22 24 days the wheat bran lots were changed to ration R1.

From this test it seems that wheat bran compares favorably with cottonseed hulls for gradually introducing a high grain ration to finishing cattle.

Starting cattle on a high grain ration (92% sorghum grain) remains yet to be completely tested. Ten heifers brought in from pasture in the Fall of 1964 were started on such a ration. Two of the ten experienced severe digestive upsets and one nearly died. The ration was somewhat different from the one outlined here but contained about the same percentage of grain.

During the first 19 days on test (Table 26) the heifers on the high grain ration (R1). Lots 21 and 22, had a much lower concentrate intake than the other heifers about 8 pounds per head daily compared with 16-17 pounds for the wheat bran lots. Cottonseed hull rations seemed to be most palatable of all at around 20 pounds of intake daily. Low intake of Lots 21 and 22 is unexplained. Their ration was available at all times in a self-feeder. Performance over a short period (19 days) is difficult to evaluate due to variation in cattle weights from day to day. All lots seemed to be gaining satisfactorily, however.

For the entire 149-day trial, lots where hay was omitted gained more and required less feed per pound of gain than when hay was fed. Heifers in Lots 18 and 23, wheat bran lots, graded about a third of a grade lower than those on other treatments.

Level of Protein for Heifer Calves Wintered on Bluestem Pasture, 1963-65 (Project 253).

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The 66 heifers used were good-to-choice Herefords purchased near Fort Davis, Texas, assigned to treatments on a random weight basis.

The heifers were rotated between pastures to minimize any differences due to pastures during the first winter grazing period and the summer grazing period. Dicalcium phosphate was fed to standardize phosphorus intake between groups during the first winter grazing period.

Heifers were fed the experimental rations shown in Table 27 three times weekly. During summer grazing only salt was fed.

The heifers were bred from July 1 to October 1, 1964. From July 1 to August 15, the heifers were penned each night and those in heat artificially bred, using semen from a Hereford bull. From August 15 to October 1, a Hereford bull was with the heifers.

The results are reported in Table 27.

The heifers receiving only sorghum grain gained less than either of the other treatments during the first winter grazing period.

The results indicate there was no advantage to feeding 2 pounds of soybean oil meal compared to feeding 1 pound of sorghum grain and 1 pound of soybean oil meal.

Heifers received only sorghum grain slightly outgained heifers on the other treatments during the summer grazing period.

During the second winter grazing period, heifers receiving only sorghum grain lost weight, an average of 0.46 pound per head daily. As the amount of soybean oil meal increased, performance improved. Heifers receiving 1 pound of soybean oil meal and 1 pound of sorghum grain per head daily gained an average of 0.48 pound per head daily, while those receiving 2 pounds of soybean oil meal gained an average of 0.89 pound per head daily.