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## Using Wheat Straw in Beef Cow Rations

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Summary

We conducted two trials to study using wheat straw in rations of either lactating or gestating beef cows maintained in dry lot.

In trial 1, cow weight changes the last 60 days of lactation were: alfalfa hay, + 26.88 lbs; two-thirds alfalfa hay -one third chopped wheat straw, +27.94 lbs; one-third alfalfa hay and two-thirds chopped wheat straw, -26.84 pounds. Gains by the cows' calves; 146, 143, and 144 pounds, respectively, did not differ statistically. Cows receiving one-third alfalfa hay and two-thirds chopped wheat straw lost condition as measured by weight/height ratios, while those on the other two treatments gained condition. The results suggest that beef cows in dry lot can perform satisfactorily on two-thirds alfalfa hay and one-third wheat straw.

In trial 2, gestating cows were fed dry or soaked ground wheat straw and 5 pounds of alfalfa hay. Cows on both rations lost weight. Those on dry straw also lost condition, while those on soaked straw maintained condition. Wheat straw appears to be one way of reducing wintering costs of cows, but it may not be satisfactory for young cattle or thin cows.

Introduction

About 11 million acres of wheat are harvested annually in Kansas. For each ton of grain harvested, one ton of residue (wheat straw, cracked grain, and chaff) is left. This low quality residue is seldom used as feed. Its availability and low cost might make wheat straw economical in a cow-calf operation.

Previous work here has shown that beef cows can maintain or gain weight on rations primarily of wheat straw. We continued the research to find better ways to use wheat straw in beef cow operations.

Experimental Procedure

Wheat straw was collected in big round bales soon after the grain was harvested. Straw was ground to eliminate feed wastage and to help us measure consumption, except for 13 days in Trial 1 when straw was fed from big round bales.

In both Trials, percentage Simmental cows maintained in dry lot were divided into treatment groups by weight and condition. They were in the last 60 days of lactation in trial 1 and in mid-gestation in trial 2.

Cow condition in Trial 1 was established by weight/height ratios (weight in pounds divided by height in inches at the hip). In Trial 2, cow condition was established by visual scores (1 = very thin; 10 = very fat). In both trials, cows were weighed after feed and water had been withheld 14 hours.

Treatments in Trial 1 were 1) alfalfa hay; 2) two-thirds alfalfa hay, one-third straw; 3) one-third alfalfa hay, two-thirds straw fed to appetite, the last 60 days of lactation (8/4/78 - 10/3/78). All rations included 4 pounds of milo per head per day. Calves had access to creep feed the entire test period.

In Trial 2 (gestating cows) were fed either dry or soaked (30% dry matter) wheat straw for 59 days (11/7/78 - 1/4/79).

In both trials, rations were analyzed for crude protein, calcium, phosphorus, and acid detergent fiber (Table 11.1). Low acid detergent fiber indicates more energy.

### Results and Discussion

Trial 1. Dry matter intake and cow performance are shown in Table 11.2. Cows receiving alfalfa hay or two-thirds alfalfa hay, one-third straw gained weight but those receiving one-third alfalfa hay, two-thirds straw lost weight. All calves performed equally well.

Trial 2. Cows fed dry straw lost condition and 21.25 lbs while those fed soaked straw lost 38.0 pounds but maintained condition. Cows on dry straw ate 28.2 lbs dry matter, while those on soaked straw ate 24.24 lbs, which may explain different weight losses. In our previous work (Cattlemen's Day, 1978), dry cows fed soaked straw 109 days gained 91 lbs and maintained condition.

This time we fed soaked straw during early winter but extreme cold weather the last few weeks of the trial caused numerous problems in machinery maintenance and feeding. Because soaked straw froze in the bunk, it had to be made up and fed twice daily.

Table 11.1. Roughage composition in Trials 1 and 2 (100% D.M.).

	Trial 1 Dry wheat straw	Trial 2 Dry wheat straw	Trial 1 Alfalfa	Trial 2 Soaked wheat straw
Crude protein, %	4.06	4.03	15.39	4.10
Calcium, %	.302	.306	1.75	.288
Phosphorus, %	.096	.104	.301	.094
Acid detergent fiber, %	54.57	52.47	36.84	48.44

Table 11.2. Effects of ration on cow performance, Trial 1.

Ration	2/3 straw 1/3 alfalfa	1/3 straw 2/3 alfalfa	All alfalfa
Number of cows	19	19	17
Average starting weight, lbs	1081.36	1084.94	1111.05
Average ending weight, lbs	1054.52	1112.89	1137.94
Total weight change, lbs	-26.84 <sup>b</sup>	27.94 <sup>a</sup>	26.88 <sup>a</sup>
Average starting weight/height ratio	21.03	20.94	21.77
Average ending weight/height ratio	20.51	21.49	21.80
Total weight/height ratio change	-0.521 <sup>b</sup>	0.547 <sup>a</sup>	0.510 <sup>a</sup>
60 day average calf gain, lbs	143.78	143.36	145.76
Forage per day, lbs	26.44	27.24	27.04
Milo per day, lbs	4.00	4.00	4.00

<sup>a, b</sup>Means in the same row with different superscripts differ significantly (P<.01).

Table 11.3. Effects of ration on cow performance, Trial 2.

	Soaked straw	Dry straw
Number of cows	27	27
Average starting weight, lbs	1255.7	1242.6
Average ending weight, lbs	1217.7	1221.37
Total weight change, lbs	-38.0	-21.25
Average starting condition*	5.24	5.59
Average ending condition*	5.24	5.35
Total condition change*	.00	-.24
Straw intake (dry basis)	24.1	28.2
Alfalfa hay	5.0	5.0

\*Condition score is average of visual appraisal by two men with 1 = extremely thin, 10 = extremely fleshy.