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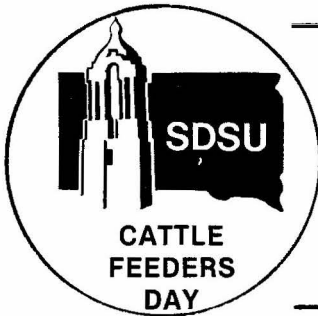
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OAT HAY OR OAT HAYLAGE IN HIGH ROUGHAGE RATIONS

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In a previous experiment (A.S. Series 77-12) cattle fed oat haylage (48.4% dry matter) stored in a concrete stave silo gained at a faster rate and more efficiently than those fed baled oat hay (88.2% dry matter). Harvesting losses in dry matter were higher for hay, but losses in storage were higher for the haylage. Net cattle gains were 24% more from haylage than from hay harvested from essentially equal land areas.

Forage yields were low in the previous experiment because of a low seeding rate and drought conditions. However, grain content in relationship to forage was good and the amount of grain in the forage dry matter was estimated to be about 40%.

Oat forage may vary considerably between years in yield and in chemical composition. Therefore, it was considered advisable to repeat the experiment under similar conditions to obtain more information on the comparative value of an oat crop harvested as hay or haylage.

Procedures

Forty-eight steers (37 Herefords and 11 Hereford crosses) were used in the experiment. They were allotted into eight pens of six each to be similar on the basis of weight and breeding. Oat hay was fed to four pens of the cattle and oat haylage to the other four pens.

Two fields of oats were harvested for the experiment. Forage yields were similar (about 2 tons dry matter per acre). Grain yield was low in relationship to the amount of forage because of rust infestation and hail damage to the crop. The grain varied considerably in stage of maturity at harvest--from boot to hard dough stages--because of the hail damage. It was recognized that there would be a low yield of light weight grain but there would be a good yield of forage.

An equal number of windrows, uniformly distributed over each field, were chopped for haylage and for hay. That for haylage was chopped from one field on July 8, 1978, and from the other field on July 12.

The forage harvested as hay was dry chopped from the field on July 15, 18 and 19. Light showers resulted in the delay in chopping but was not considered to cause any appreciable weather damage.

Chopped forage was hand separated into forage and grain. Upon basis of this separation, the dry matter yield as grain was 17%. Test weight of the separated grain was 26 lb. per bushel. These values appear to check closely with estimated yield and quality of grain in the standing crop.

The haylage was stored in an 18 foot x 50 foot upright concrete stave silo. The field chopped hay was stored under cover in a hay shed. Dry matter content as chopped was 40.05% for the haylage and 86.18% for the hay. Total protein contents for haylage and hay, dry basis, were 11.77 and 11.97%.

The cattle were fed hay or haylage in amounts so feed would be available at all times. Feeding was once daily. The only other feeds offered were free-choice trace mineral salt and a calcium-phosphorus supplement. The experiment was terminated for each group of cattle when their supply of forage was exhausted.

Results

Results of the experiment are in table 1. The experiment was started on July 20 and was terminated on April 14 (268 days) for the hay group and on June 17 (332 days) for the haylage group. The winter was a severe one for feeding cattle outside without shelter. Obviously, the rations were low in energy for weight gains typical of backgrounding operations under weather conditions experienced. However, results represent comparisons of the two forages under those conditions.

Feedlot Performance

A major difference between the two forages was in feed consumption. Steers fed the haylage consumed an average of approximately 5 lb. less dry matter daily than those fed the hay. In the previous experiment from mid-July to late November with similar initial weight of cattle, there was about equal dry matter consumption between oat hay and oat haylage (53% dry matter as fed). The haylage contained less dry matter in the current experiment. Greatest differences in dry matter consumption between hay and haylage occurred during the colder months when feed intake did not increase as much for haylage as for hay.

Weight gains were low and feed requirements were high for this long experiment. Average daily gain in mid-October (86 days) under favorable weather conditions was 1.75 lb. for the haylage group and 1.64 lb. for the hay group. Daily dry matter consumption during this time averaged about 15.7 and 16.5 lb., respectively, for haylage and hay. This rate of gain was somewhat lower than in the previous experiment. The forage in the current experiment was considerably lower in amount of grain dry matter (17%) than in the previous one (40%). A lower protein content (slightly less than 12% in comparison to about 16.5% in the previous experiment) may have also been a factor in the lower performance.

Negative weight gains were encountered on weigh days in mid-November and mid-December. The November weigh day was a few days after the early November blizzard. Weight gains remained at rather low levels through mid-March. However, the average daily gain for the haylage group was slightly greater than for the hay group throughout the experiment even with the lower dry matter intake. The higher rate of gain with the lower intake of feed dry matter resulted in a substantial improvement in feed efficiency for haylage over hay (34.8%, dry basis).

Haylage and Hay Comparisons

Procedures used in harvesting for haylage and hay were considered to have resulted in uniform areas in size and forage yield. Dry matter yield of haylage exceeded that for hay by 5.8%. This difference between haylage and the field chopped hay was similar as obtained between haylage and baled hay the previous year.

Dry matter content of samples taken at feeding throughout the experiment averaged 86.87% for hay and 43.62% for haylage. There was essentially no change from dry matter at harvest for hay but an increase of 3.57 percentage units for haylage.

Loss in dry matter between storing and feeding amounted to only 0.65% for hay but 10.16% for haylage. Dry matter losses of this order are not uncommon during several months of storage for silage crops in upright concrete stave silos. Harvesting losses were less for the haylage, resulting in a net difference of 4.3% less dry matter fed from haylage.

Cattle gains per ton of dry matter stored were 83 lb. for haylage and 54 lb. for hay. These are rather low gains and considerably less than in the previous experiment (163 lb. for haylage and 141 lb. for hay). Total cattle gains from similar areas harvested were 5900 lb. for haylage and 3974 lb. for hay. On the basis of total gains, the haylage had a value of 148% that of hay.

Summary

Results of our experiments show that under good harvesting weather slightly more dry matter is recovered from oat forage harvested as haylage than hay. The difference was in the order of 6 to 7% whether the hay was baled or field chopped at about 86% dry matter.

Hay stored, under cover, baled or chopped, had only small losses in storage. Haylage dry matter losses during storage in a concrete stave silo were 10 to 12%.

Yearling steers (about 675 lb.) gained faster and more efficiently when fed oat haylage than when fed oat hay. Differences encountered amounted to 24% in one experiment and 48% in another on the basis of forage dry matter harvested from similar areas.

Results of the research show an advantage for oat haylage over oat hay. Results indicate considerable variation may be encountered. Likely factors involved are grain content of the forage, quality of the grain, protein content of forage and conditions of feeding as to weather and cattle. The advantage for haylage may be increased as these factors become less favorable for optimum production. However, more research is needed in order to adequately evaluate effects of these factors.

Table 1. Oat Hay and Oat Haylage for Growing Cattle
(July 19, 1977, to April 14 or June 17, 1978)

Item	Oat hay	Oat haylage
No. animals	24	23
Days fed	268	332
Avg init. shrunk wt., lb.	677	676
Avg final shrunk wt., lb.	842	924
Avg daily gain, lb.	.62	.75
Avg daily feed, lb.		
As fed	26.3	40.9
Dry basis	22.9	17.8
Feed/100 lb. gain, lb.		
As fed	4263	5535
Dry basis	3703	2414
Composition of forage, % dry basis		
At harvest	86.18	40.05
As fed	86.87	43.62
Total protein	11.97	11.77
Dry matter stored		
Pounds	148,066	156,706
Percent of hay ^a	--	105.8
Dry matter fed		
Pounds	147,110	140,777
Storage loss, %	.65	10.16
Percent of hay	--	95.7
Cattle gain from forage		
Per ton feed, lb. (DM)	54	83
Percent of hay		154
Per ton stored, lb.	54	75
Percent of hay		139
Total cattle gain, lb.	3974	5900
Percent of hay		148

^a Hay used as base and assumed to be 100.