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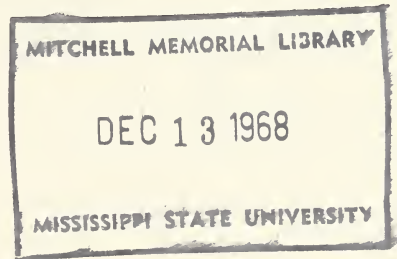
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**The Effect of
Types and Quality Roughages
On Subsequent Performance of Steers
During the Winter Period**



**MISSISSIPPI STATE UNIVERSITY
AGRICULTURAL EXPERIMENT STATION**

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SUMMARY AND CONCLUSION

In a two-year study, 72 steers were used to evaluate three different winter rations, and to determine what effect the ration had on later summer grazing gain and again after being placed in the feedlot. The three winter rations studied were: (1) soybean straw plus grain and CSM; (2) Coastal Bermuda grass hay plus grain and CSM; and (3) high-energy urea-treated silage (milo and corn).

In both winter phases steer calves fed soybean straw plus grain and CSM gained significantly less than the other two treatment groups. The soybean straw fed steers were also the most inefficient producers and had a higher feed cost per pound of gain. The high-energy urea-treated silage fed steers were the fastest gaining and most efficient producers. Feed cost per pound of gain favored the silage fed steers. Coastal Bermuda hay fed steers had the highest wintering cost of the three treatment rations studied.

Summer gains after the winter period corresponded to what was expected. The steers that gained faster during the winter produced the least gain during the summer. There was no significant difference in rate of gain between the three treatment groups during the summer grazing period; however, the soybean straw fed steers gained at a faster rate, making up some of the gain that was restricted during the winter.

Feedlot gains were little affected by previous winter rations, although the Coastal Bermuda grass hay fed steers during the winter tended to gain less during both trials, while in the feedlot. Efficiency of gain and feed cost per pound of gain favored the soybean straw and high - energy urea - treated silage fed steers with the Coastal Bermuda hay fed steers having the poorest efficiency and highest feed cost per pound of gain.

Carcasses information collected only on the steers in the second trial indicated no significant difference in any of the carcasses traits collected; however, the steers fed silage during the winter produced carcasses with more finish than the other two groups.

Rate of gain for the entire study in both trials, when summarized, showed winter ration made little difference; however, for any one period during the study treatments variation in rate of gain was somewhat variable.

Return per steer (including only the feed and initial steer cost) was greater for the steers fed the high-energy urea-treated silage during the winter, with the least return coming from steers fed the soybean straw.

The Effect of Types and Quality Roughages During the Winter Period on Subsequent Performance of Steers

By WILLIAM A. PUND and PETER G. HOGG¹

Growing and finishing out steers is an important system of beef production for cattlemen of the Delta. Winter rations represent one of the major costs in growing out steers. The most desirable level of wintering depends upon the purpose of animals after winter; whether they go on grass for further growth and then to the feedlot, or go directly to the feedlot for finishing.

The purpose of this study was to evaluate three different types and quality roughages for growing steer calves during the winter and to determine what effect these roughages have on subsequent performance on summer grass and later performance in the feedlot. The study was divided into three phases; winter phase, summer phase, and feedlot phase.

Two trials were conducted over a period of two years. The first trial began December 2, 1965 and concluded December 21, 1966, a total of 378 days. The second trial began December 5, 1966 and concluded January 8, 1968, a total of 398 days.

Materials and Methods

At the beginning of each trial, 36 steer calves were allotted at random by weight and breed into three treatment rations. The rations studied were (1) soybean straw plus 2 lbs. ground shelled corn and 1.5 lbs. cottonseed meal; (2)

Coastal bermudagrass hay plus 2 lbs. ground shelled corn and 1.5 lbs. CSM; and (3) only high-energy urea - treated silage.

The roughage for each ration was common to the area and was produced and harvested by the Experiment Station. The soybean straw, picked up after the soybeans had been combined, was chopped and blown into a wagon with the forage chopper. The Coastal bermudagrass hay was baled from hay plots on the Station. The silage was cut at a height to give a high grain to roughage ratio. At the time of ensiling 10 lbs. urea and 10 lbs. feed grade limestone were added per ton of silage material.

Steers on soybean straw and Coastal bermuda hay rations were fed all the roughage they could eat, plus the 2.0 lbs. grain, and 1.5 lbs. cottonseed meal. No additional grain or protein was fed the steers on the high-energy urea-treated silage ration.

After the steers had been on the winter ration for 112 days, they were placed on summer grazing of Coastal bermudagrass for approximately 150 days, in both trials, and then put in the feedlot and fed high-energy urea-treated milo silage in the first trial and high-energy urea-treated corn silage in the second trial.

Results

Winter: During the course of the study the steers had little or no health problems. Steers fed soybean straw consumed an average of only 6.58 lbs. of the straw daily, which was considerably lower than the 9.16 pounds of Coastal Bermudagrass hay consumed by steers on this roughage. Since steers on the silage

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Table 1. Performance data for steers on three rations summarized for two years.

	Initial weight	Final weight	Average gain	Daily gain	Feed/steer per day	Total Dry matter/day	Dry matter /cwt. gain	Feed cost/lb. gain
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	cents
WINTER:								
Soybean straw	462	531	70	0.62*	10.1	9.18	1723	21.2
Coastal B. hay	459	581	122	1.09	12.7	11.53	1115	16.1
High E. silage	462	598	136	1.22	24.1	10.10	822	9.4
SUMMER:								
Soybean straw	528	653	125	0.87				7.2
Coastal B. hay	581	683	102	0.70				8.8
High E. silage	593	690	98	0.67				9.3
FEEDLOT:								
Soybean straw	654	929	275	2.16	45.3	20.23	1142	13.6
Coastal B. hay	684	935	251	1.91	42.5	20.22	1317	15.4
High E. silage	691	956	265	2.06	43.6	19.51	1151	13.7

*Significantly different from other treatments at the .05 level of probability.

Feed cost: Soybean straw, \$8.00/ton; Coastal Bermuda hay, \$23.95/ton; high-energy urea-treated silage (milo - \$13.28/ton and corn - \$5.75/ton); ground shelled corn, \$1.43/bu.; cottonseed meal, \$4.37/ton; and pasture - \$11.38/acre - 1.25 steers per acre=\$9.10/steer.

received no additional grain or protein, a total dry matter daily consumption per treatment would be a more realistic comparison. Steers fed the soybean straw plus corn and CSM consumed an average of 9.18 lbs. total of dry matter. On the Coastal Bermudagrass hay plus corn and CSM ration steers consumed an average of 11.53 lbs. while those on silage averaged 10.10 lbs. total of dry matter daily.

Rate of gain varied between trials, which was unexplainable since the steers for both trials came from the same herd and the feeds were relatively the same in chemical analysis between trials. The only difference in feeds between trials was the urea-treated corn silage fed in the first trial, and urea-treated milo silage was fed during the second trial, during the winter.

Average daily gain was 0.62 for the soybean straw, 1.09 Coastal Bermuda hay and 1.22 high-energy urea-treated silage. In both trials steers fed soybean straw gained significantly less than the other two groups, with no significant difference in rate of gain occurring between the remaining two groups.

Not only did the steers receiving the soybean straw gain significantly less than the other two groups, they also were the most inefficient producer since they required a total of 1723 lbs. dry matter per 100 lbs. gain compared to 1115 lbs. dry matter for the Coastal Bermudagrass hay and 822 lbs. for the silage groups.

This inefficiency in rate of gain on the soybean straw affected the feed cost per pound gain. Based on prices at the time of the study the feed cost per pound gain for the soybean straw fed steer was 21.2c compared to 16.1c for the Coastal Bermuda hay fed steers and 9.4c for the silage fed steers.

When cost of feed for wintering the three groups of steers was considered, the steers fed the high-energy urea-treated

silage were the most economically wintered, \$12.15 per steer compared to \$16.01 for soybean straw and \$19.18 for Coastal Bermudagrass hay.

Summer: It is apparent from both trials that steers making the least gain during the winter made the most gain during the summer.

The soybean straw fed steers gained more while on summer grazing; 0.87 lbs. per day compared to 0.70 lbs. for the Coastal Bermudagrass hay group, and 0.67 lbs. for the silage fed group. However, this increase in gain was not significant.

When grazing cost per pound of gain was based on permanent pasture establishment and maintenance cost per acre, and with a carrying capacity of 1.25 steers per acre, the soybean straw fed steers were the most economical. Pasture cost per pound of gain ranged from a high of 9.3c for the steers fed silage to a low of 7.2c for the group fed soybean straw with 8.8c per pound of gain for the Coastal Bermudagrass hay fed group.

Feedlot: Rate of gain of the steers varied considerably between trials. In the first trial the steers were fed high-energy urea-treated milo silage. Therefore, rate of gain was consistently low for all three treatments. Milo harvested as high-energy silage has not produced gains equal to that of corn silage in feeding trials conducted at the Delta Experiment Station.

During the feedlot phase of the second trial, high-energy urea-treated corn silage was fed and rate of gain was improved over the first trial by 1.20 lbs. per day. Average daily gain for the combined three treatment groups during the feedlot phase was 1.44 lbs. per day for the first trial, and 2.64 lbs. per day for the second trial. These low gains during the first trial affected the efficiency and cost of gain very much.

Rate of gain between treatment groups of both trials did correspond. The group

fed Coastal Bermudagrass hay gained the least.

The average daily gain between groups was not significantly affected by the previous winter ration. However, the steers fed the soybean straw gained at a faster rate during the feedlot, or finishing phase. The average daily gain was 2.16 lbs. per day for the soybean straw fed steers; 1.91 for the Coastal Bermuda hay and 2.06 lbs. for the silage. Soybean straw was consumed at the rate of 45.3 lbs. of feed daily compared to 42.5 lbs. for Coastal Bermuda hay, and 43.6 lbs. for silage.

Steers that received Coastal Bermuda hay during the winter not only gained at a slower rate, but were also the most inefficient producers since they required a total of 2803 lbs. of feed per 100 lbs. gain, compared with 2474 for the silage and 2460 pounds for soybean straw fed groups. Cost per pound of gain in the feedlot was affected by the winter ration fed to the steers, but not significantly. Feed cost per pound of gain ranged for a high of 15.4c for the group wintered on Coastal Bermuda hay to a low of 13.6c for the soybean straw fed group, and with a 13.7c for the steers fed the silage during the winter.

The first trial did not produce finished steers; they were sold as feeders, averaging approximately 825 lbs. In the sec-

ond trial the steers finished out at approximately 1045 lbs. and were sold on grade and yield.

Previous winter ration did not significantly affect any of the carcass characteristic; however, the high-energy urea-treated silage steers were carrying more finish. Dressing percentage were low for all three treatments, compared to steers that are fed on dry or part-dry ration. The average final grades of the carcasses were low choice to average choice.

No significant difference was found between the treatment groups, although the steers fed silage during the winter graded higher than the other two groups and the soybean straw fed group graded the lowest.

Rate of gain was not significantly affected by winter ration when the entire study period was considered. Average daily gain for the steers fed soybean straw was 1.20 lbs. The steers fed Coastal Bermuda hay gained 1.23 lbs. per day, while the silage fed steers averaged 1.27 lbs. per day.

A considerably larger return was made on the steers fed the silage during the winter phase of the study than the other two groups. This group averaged \$75.39 as compared to \$61.86 for the Coastal Bermuda hay group, and \$52.34 for the soybean straw groups.

Table 2: Carcass data on steers from trial two

	Soybean straw	Coastal Bermuda hay	High- energy silage
Carcass weight, lbs. ¹	571	588	615
Dressing percent	56.1	56.3	56.9
Conformation score ²	12.58	12.16	13.00
Marbling score ³	5.25	5.83	6.25
Grade ⁴	12.00	12.58	12.83
Yield grade ⁵	2.50	2.58	2.83

¹less 2% shrink of hot carcass weight.

²10=average good, 11=high good, 12=low choice, 13=average choice.

³3=trace, 4=slight, 5=small, 6=modest, 7=moderate, 8=slightly abundant.

⁴10=average good, 11=high good, 12=low choice, 13=average choice.

⁵3=50.0 - 47.7 percent - 2=52.3 - 50.0 percent.

Table 3. The effect of winter ration on the production of steers.
(Two-year average)

Treatments	Soybean straw	Coastal Bermuda straw	High- energy silage
Number steers per lot	12	12	12
Winter as calves:			
Initial weight, lbs.	462	459	462
Final weight, lbs.	531	581	598
Gain, lbs.	70	122	136
Feed cost ¹	16.01	19.18	12.15
Steer cost ²	111.08	111.08	111.08
Summer as yearling:			
Initial weight, lbs.	528	581	593
Final weight, lbs.	653	683	690
Gain, lbs.	125	102	98
Gain to date, lbs. ³	195	225	234
Feed cost	9.10	9.10	9.10
Finished as two-year-old:			
Initial weight, lbs.	654	684	691
Final weight, lbs.	929	935	956
Gain, lbs.	275	251	265
Gain to date, lbs. ³	467	486	494
Avg. daily gain to date, lbs. ³	1.20	1.23	1.27
Feed cost ¹	24.35	22.89	23.20
Selling price/cwt. ³	23.64	24.29	24.28
Value/steer, 3% shrink	217.88	224.09	230.95
Return/steer to date ⁴	57.34	61.86	75.39

¹Feed prices are shown in feed price table.

²Actual price per steer which was the same for all lots.

³Gain since the beginning of the test.

⁴Return per steer from the beginning of the test when only steer cost and feed cost were considered.