12-1-1953

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BULLETIN 506 NOVEMBER 1953

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AGRICULTURAL EXPERIMENT STATION
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ON THE COVER:

This photo shows a group of Experiment Station cows grazing oat forage as a part of the study on wintering bred beef cows.

Methods Of Wintering Bred Beef Cows

By TROY B. PATTERSON[1]

Supplying satisfactory rations most economically during the winter months has long been the number one problem of commercial beef producers. Too often success of winter rations has been measured by cow survival alone. Recent experiments indicate that other factors are affected by the winter ration. Some of these are: birth weight, weaning weight, and over a number of years the percent calf crop may be affected.

Experiments reported by Leveck (1939) and Cullison (1940) testing several rations using home grown feeds for wintering beef cows included the following daily rations: 20 pounds grass hay, 1 pound cottonseed meal; 20 pounds lespedeza, soybean, or other legume hay; 15 pounds cottonseed hulls, 5 pounds grass hay, and 2 pounds of cottonseed meal; 30 pounds sorghum silage, 5 pounds grass hay, and 1 pound cottonseed meal. All of the above rations proved quite satisfactory for wintering bred beef cows weighing approximately 1,000 pounds.

Since most of the above rations require considerable labor in the harvesting, storing, and feeding, many stockmen are looking for a method of wintering their beef cows that requires a minimum of labor. With this in mind, the Mississippi Experiment Station started a test during the fall of 1946 to study the methods of feeding that require a minimum of labor and yet possibly improve on the existing rations.

Five Rations

One hundred twenty-five mature bred beef cows of Angus and Hereford breeding were divided into five uniform groups of 25 each and wintered as follows: Group I was fed a daily ration of 30 pounds sorghum silage, 5 pounds grass hay, and 1 pound cottonseed meal; Group II was wintered in permanent pasture where the cows had access to grass hay clipped and stacked in the pasture, and they were fed one pound cottonseed meal daily; Group III had stacked grass clippings alone in permanent pasture; Group IV cows were grazed continually on oat forage; Group V was wintered on oat forage for three hours daily. Because of the uncertainty of the oat crop, Groups IV and V were changed to fescue and ryegrass at the conclusion of 3 years study.

The winter period covered in this study was from about December 1 to March 15 or until pasture was available in the spring. All cows on test were handled in the same manner during the remaining portion of the year. They were divided into bull units according to breeds, without reference to winter treatment, and were placed on good permanent type pasture, consisting of clover and grass until about June 1 and Bermuda and Dallisgrass the remainder of the summer. The breeding season was from May 1 to August 1 so that calves would be dropped in February, March, and April.

As soon after birth as was practical each calf was weighed, numbered, and its sex recorded. In addition, the date of birth and the dam's number were recorded. All calves are weaned about the middle of November and weaning weights recorded at this time.

The cows in Group I were wintered in dry lot at the beef barn where tap water was available. Calving began on dry lot and continued on pasture after it became available in the spring.

The other groups were wintered in their respective pastures where water was

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[1]This report covers research work done by Henry H. Leveck, Ben F. Barrentine and Lindsey Horn in addition to the author.

Stacked pasture clippings alone and with cottonseed meal were two of the beef cow winter rations tested.

available in stock ponds. No shelter other than natural cover was provided for the cows wintered on pasture. No minerals other than block salt were available to all cows throughout the year.

Results of the first 6 years of this experiment are summarized in Table 1. Some of the differences in calving percentages may be explained by weather conditions of the preceding winter. The percent calf crop is affected by the previous winter feeding period rather than the one just prior to calving. This may be explained by the fact that the winter ration affects subsequent conception rate, so that cows wintered well will settle better in the spring, resulting in a higher percent calf crop the following year.

An example of this may be seen by referring to Table 1, ration 3, 1951 percent calf crop. At least a portion of the higher percent calf crop for that year was due to the milder winter of 1950 and as a result more green forage was available to these cows. Other percentages for 1951 were not affected to such a great extent because the rations of the other groups were sufficient to give normal percent calf crop.

Loss or Gain of Weight in Cows

A six-year average of the gain or loss during the winter months shows considerable variation between various rations, with a high of 67 pounds gained for cows on continuous grazing and a net loss of 9 pounds for cows wintered on pasture clippings alone. Oats were used as the grazing crop during the first 3 years of the experiment but due to the risk of winter kill, continuous grazing was changed to fescue and part-time grazing was changed to ryegrass.

Fescue was seeded on permanent pasture sod and nitrated with 150 pounds of ammonium nitrate per acre in the fall. For the three years included in this study fescue (one acre per cow) has not produced sufficient forage any year to maintain the cows without the use of harvested feeds. Not all of the difference in gain or loss of weight then is due to grazing but a portion is due to other winter feeds. This was also true with part-time grazing where an early freeze in 1951 and late start due to drought caused a shortage of ryegrass forage during these years.

All rations produced a net gain for the six-year average, with the exception of pasture clippings alone. The cows fed silage, hay, and cottonseed meal showed a loss in 4 of the 6 years of the test, but had a slight average gain over the entire 6 years. Less variation was noted between years in this group because these cows are less affected by differences in the severity of the winter months.

All groups except those on silage, showed a relatively higher gain during the somewhat milder winter of 1949-50. During that winter cows given access to pastures picked up considerable green forage that was not available for those on dry lot. It was also noted that even though the gain or loss varied with the ration during the winter months, this difference tended to disappear before the end of the summer grazing season.

Weight Records of Calves

There is considerable variation in birth weight of the calves between the groups, with a range of 60.8 in Group III in 1947 to 72.3 in Group IV in 1951. An average for the six years shows a slight advantage in favor of the continuous grazing group with smaller calves from the cows wintered on pasture clippings alone. However, these differences are not great enough to be significant.

There was little difference between rate of gain for the different groups. A slightly higher daily rate of gain in favor of the continuous grazing group was noted and the cows on clippings alone produced calves that gained less than the calves from other groups. Perhaps a clearer picture of the effects of the winter rations may be had by looking at the weaning weights of the calves. Weaning weights for the calves in 1948 are not available. The lighter weaning weights for 1947 and 1949 are due to earlier weaning dates. Calves were weaned in September during these years and in November during 1950, 1951, and 1952.

With the exception of 1952, calves from cows that were wintered on pasture clippings weaned at a lighter weight than the calves from other groups. During the winter of 1951-52, the cows on 3-hour ryegrass grazing lost an average of 82 pounds per head due to insufficient forage as was pointed out earlier. During the same period, the cows on pasture clippings lost only 26 pounds per head. These losses were reflected in lower average daily gains and lighter weaning weights for the calves in these groups.

An average of the five years weaning weights available for this study shows a significantly lower weaning weight for calves on pasture clippings alone. This lower weight is due in part to lower average daily gains and in part to younger calves at weaning time. On an average they were approximately one week younger than the calves from other groups.

Percent Calf Crop

One of the most striking differences between the performance of the cows on pasture clippings alone and the cows on other rations is reflected in the percent calf crop. Averages based on the six complete years show no significant difference between the group, except Group III (on pasture clippings) which had about 10 percent lower calf crop than the average of the other lots.

Since the 1947 calf crop was materially affected by the previous winter treatment before the start of the test, it is then permissable to exclude this year from the calf crop averages. When this is done, the difference in percent calf crop becomes even greater with the following

Table 1. Results, expressed as averages, of test on method of wintering bred beef cows at State College, 1947-52.

Year	Gain or loss, cow wt., lbs[1]	Birth wt. calves, lbs.	Daily gain calves, lbs.	Weaning wt. calves, lbs.	Percent calf crop	Birth date calves	Age at weaning, days
Group I—30 lbs. sorghum silage, 5 lbs. hay, 1 lb. cottonseed meal							
1947	—6	61	1.70	377	68	3/1	185
1948	—3	64			100	3/11	
1949	49	65	1.68	358	83	3/2	174
1950	—15	68	1.51	452	90	2/25	255
1951	—9	69	1.43	428	84	3/9	249
1952	—5	69	1.51	425	94	3/23	235
Average	2	66	1.57	407	86	3/7	219
Group II—Pasture clippings, 1 lb. cottonseed meal							
1947	—25	63	1.78	380	72	3/4	182
1948	—22	66			86	3/13	
1949	51	72	1.72	356	80	3/11	164
1950	23	66	1.51	437	85	3/3	247
1951	19	66	1.47	437	86	3/5	253
1952	—1	67	1.51	440	86	3/10	248
Average	9	66	1.58	409	83	3/9	217
Group III—Pasture clippings alone							
1947	37	60	1.67	367	76	3/1	185
1948	—30	61			68	3/18	
1949	4	61	1.72	342	79	3/13	162
1950	2	72	1.45	422	63	3/12	241
1951	29	69	1.42	413	86	3/15	243
1952	—26	68	1.45	410	70	3/22	238
Average	—9	65	1.54	390	74	3/14	212
Group IV—Continuous oat grazing[3]							
1947	124	66	1.78	400	68	2/26	188
1948[2]	36	68			78	3/5	
1949	70	66	1.85	380	92	3/6	169
Continuous fescue grazing[3]							
1950	57	72	1.62	485	94	2/27	253
1951	94	72	1.54	450	88	3/7	255
1952	21	71	1.47	411	90	3/27	230
Average	67	69	1.66	426	85	3/7	219
Group V —Limited oat grazing[3]							
1947	48	68	1.76	392	72	3/1	185
1948	—3	63			91	3/3	
1949	23	66	1.91	381	84	3/11	164
Limited rye grazing[3]							
1950	—22	68	1.50	441	93	3/7	249
1951	—106	66	1.50	446	90	3/7	252
1952	—82	70	1.39	400	73	3/22	236
Average	—19	67	1.60	412	84	3/9	217

[1]Average weight of cows at the beginning of the study December 2, 1946: Group I, 937; Group II, 964; Group III, 948; Group IV, 941; Group V, 953.

[2]There were 25 cows in each group every year except 1948 when there were only 10 cows on continuous grazing.

[3]All winter grazing rations required supplementary stored feed when dry weather or low temperature reduced forage yields. See discussion in text.

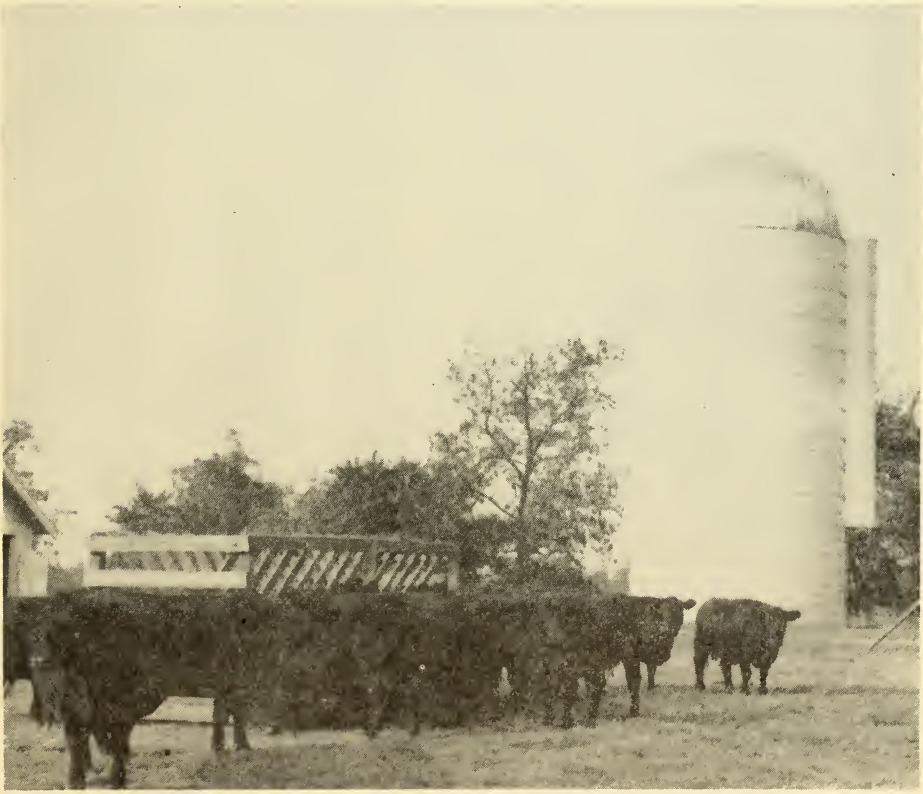
percentages noted: Group I, 90%; Group II, 85%; Group III, 73%; Group IV, 89%; and Group V, 87%. This probably reflects more accurately the actual effects of winter ration on percent calf crop.

Without exception, milder winters that caused some green forage to be available on permanent pastures were reflected in a higher conception rate the following spring, particularly for the cows on the poorer rations. A good example of this may be seen by referring to Table I, Group III, 1951, where a 86.6 percent calf crop was recorded for these cows following the comparatively mild winter of 1949-50. The 100 percent recorded in Group I for 1948 makes the average for this group appear somewhat better than is the actual case. However, over a longer period of time this effect would tend to be reduced to a minimum.

Cost of the Various Rations

Due to the differences in labor, types of crops grown, and machinery available in the different sections of the state no attempt will be made to give specific cost of each ration. However, approximate cost figures will be given so that comparisons can be made.

Costs of producing silage vary with several factors such as yield, lodging, method of harvesting, storage, and others. Cost of producing silage at the Station has varied considerably from year to year, but on the average it has cost about $6.00 per ton to produce and harvest. On this basis, ration 1 will cost about $17 to



One group received silage, hay and meal in dry lot.

feed a cow for 90 days. This figure also includes the cost of hay and cottonseed meal at current market prices.

Cost of ration II is estimated at about $23.60 per cow for 90 days and ration III $20 per cow, the only difference being the cost of 90 pounds of cottonseed meal at $80 per ton. The clippings are a by-product of the pasture with labor, particularly that involved in stacking, representing the cost.

Since larger acreages are necessary for continuous grazing, the cost of this method of wintering cows is considerably higher than the other rations. Oats planted for grazing cost about $22.50 per acre and at least 2 acres per cow are needed for continuous grazing throughout the winter months. This gives about $45 per cow for Group IV. If for any reason the oats fail to produce sufficient forage and stored feeds have to be used, the cost of this ration would then be increased. Fescue used during the latter three years cost considerably less than oats due to its reseeding ability. However, when the cost of supplemental feeds are taken into consideration, a per-cow cost of $40 is reached.

The limited grazing of Group V offers a more economical picture. Only one acre of oats per cow was needed at a cost of $22.50. It is also true in Group V, as in Group IV, that if winter kill occurs additional stored feeds are needed. This was also true when ryegrass was used instead of oats. Ryegrass did offer more resistance to winter kill and cost only $20 per acre to produce.

On the basis of the above prices, ration I appears to be the most economical if the equipment, labor and storage facilities are available for handling silage.

In areas where stacking pasture clippings or other hay crops for winter consumption is practiced, the value of protein supplement should be noted in this experiment. The addition of one pound cottonseed meal daily per cow to a ration of pasture clippings gives a return of 19 pounds of beef plus a 12 percent higher calf crop. In a herd of 100 cows a $360 investment in cottonseed meal would, at this rate, return 6,315 pounds of extra beef or the equivalent of 15 extra calves. Comparing Groups IV and V, however, presents a different picture. The additional cost of $2,125 to winter 100 cows on continuous grazing would return only 2,070 pounds of beef or only about 5 extra calves which at the present price level will not pay for the additional pasture. Other similar comparisons may be made from the above data.

Summary

Five methods of wintering bred beef cows were compared by the Mississippi Agricultural Experiment Station. The study extended over six winters and involved 125 cows. Analysis of the results shows:

(1) Four of the rations (silage, hay and meal; pasture clippings and meal; and two winter grazing groups) produced almost equally good results when measured in percent calf crop and weight of calves at weaning.

(2) Grass clippings alone did not measure up to the other four rations. Cows in this group calved later and produced 10 percent less calves. Their calves gained more slowly and weighed less at weaning than those from other groups. One pound of cottonseed meal, however, added to pasture clippings made a satisfactory ration.

(3) Oats proved unsatisfactory for grazing and after three years they were replaced by fescue and ryegrass for the remainder of the test. The cost and uncertainty of the crops made production of winter grazing for beef cows a less attractive proposition than the feeding of silage.

(4) Under conditions of this test 30 pounds silage, 5 pounds hay and 1 pound cottonseed meal was the most economical of the rations which proved satisfactory.