

heifers averaged only 346 pounds at the same age. The 21 calves raised by the 1956 heifers as three-year-olds weighed 456 pounds while the 46 calves weaned by the 1953, 1954, 1955 heifers weighed 374 pounds. This difference of approximately 80 pounds per calf, favoring the lower level of feeding, could have been influenced by seasonal differences between the years in which the two groups produced their first and second calves. If we compare the age groups producing calves in the same season, however, it will be noted that the 1956 heifers, as two-year-olds in 1958, were producing calves as heavy as the 1953 and 1954 heifers producing their third calves at the same time. The 1957 group calving first in 1959 produced calves which were as heavy as the calves produced by the 1955 heifers in the same season. The second calves produced by the 1956 heifers weighed 456 pounds in 1959 which is as heavy as those produced by the 1953 and 1954 heifers producing their fourth calves in the same year, even though considerable culling of the latter two groups had already occurred by this time.

Summary

Although the experiment from which these observations were made was not designed specifically to determine the effects of level of feeding of replacement heifers from 7 to 12 months of age, the reproductive history and weaning weights of calves from heifers developed under full-feeding indicate that considerable damage to the full expression of these important maternal traits may have been caused by such a practice. Heifers which were produced by the same breeding stock and which were developed at a lower level of nutrition performed more satisfactorily in the same traits. These results suggest that breeders need to consider seriously performance testing procedures which are adopted for the development of replacement heifers. If the observations of this study are confirmed by better controlled experimentation, there is a real need to determine the nature and extent of damage which may occur under various developmental systems for replacement heifers and to determine the earliest age at which this may occur. Genetic differences will be manifest only when heifers are developed in a way that is conducive to the expression of the traits.

Pelleted Prairie Hay For Wintering Calves

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Research at many institutions has indicated that pelleting of certain beef cattle rations will result in increased gain and improved efficiency of gain. Apparently the greatest response from pelleting has been with rations containing a high proportion of roughages. Within the roughages, a greater response occurs when those of poorer quality are fed.

The value of pelleting prairie hay when fed to beef calves has been studied at the Lake Blackwell range area.

Procedure

Forty weanling heifer calves were divided into 4 lots of 10 head each and placed in enclosures at the Lake Blackwell range area. Initial weights were taken on December 11, 1959, and the test was completed on March 23, 1960. In this 103-day period the heifers in Lots 1 and 3 were fed baled prairie hay, ad libitum. Those in Lots 2 and 4 were fed prairie hay which had been ground with a hammer mill using a 3/16 inch screen and pelleted (with the assistance of steam) into 3/8 inch diameter pellets. The supplemental protein feed for Lots 1 and 2 was 0.5 lb. of pelleted cottonseed meal per head daily. Greater gains were desired in Lots 3 and 4; therefore, greater amounts of supplemental feed were offered. These heifers were fed an average of 6.0 lbs. of pelleted supplement per head daily. This supplement was 25 percent cottonseed meal and 75 percent ground milo. The intake of the individual feeds was 1.5 lbs. of cottonseed meal and 4.5 lbs. of ground milo per head daily. Twice the daily allowance of supplemental feed was fed every other day, and occasionally considerable scouring occurred in the lots fed the high level of supplemental feed.

Chemical analysis of the hay and pellets fed in this trial are not available at this time. On the basis of analyses of other samples of prairie hay harvested in the same area it is estimated that the prairie hay used in this test contained 4.5 to 5 percent protein and 32 to 35 percent crude fiber.

A mineral mixture of 2 parts ground rock salt and 1 part steamed bone meal was available in all lots.

Results

A summary of weight and feed consumption data is given in Table 1. Heifers fed the long hay (Lot 1) consumed an average of 10.1 lbs. of prairie hay per head daily and gained 0.29 lb. The gain in the 103-day period was 30 lbs. When the hay was ground and pelleted the total gain was 47 lbs. or 0.46 lb. per day. These calves consumed 12.3 lbs. of pellets per head daily. The hay required per pound of gain was 34.7 and 27.0 lbs. for the long and pelleted hay, respectively. When an appraised value of \$25 per 100 lbs. was assigned to the weight gain of the calves and current feed costs were used, the increased value of the hay due to grinding and pelleting was \$4.30 per ton.

When heifers were fed a high level of supplemental concentrates the increase in gain due to feeding pelleted hay was 25 lbs. The gains were 94 and 119 lbs. for long and pelleted hay, respectively. Hay consumption was nearly equal in the two lots. The hay per pound of gain was

Table 1.—Pelleted Prairie Hay for Wintering Calves.

Level of Feeding Lot Number Hay Preparation	Low		High	
	1 Long	2 Pelleted	3 Long	4 Pelleted
Number of heifers	10	10	10	10
Average weight per calf (lbs.)				
Initial 12-11-59	414	415	424	419
Final 3-23-60	444	462	518	538
Gain (103 days)	30	47	94	119
Daily gain	.29	.46	.91	1.16
Average daily feed consumption (lbs.)				
Prairie hay	10.1	12.3	7.6	7.5
Supplement				
Cottonseed meal	.5	.5	1.5	1.5
Ground milo			4.5	4.5
Hay per lb. of gain (lbs.)	34.7	27.0	8.3	6.5
Increased value of hay due to pelleting (\$ per ton)		4.30		16.40

reduced 22 percent (8.3 vs. 6.5 lbs.). When value of gains and costs of feeds were considered the increased value of the hay due to grinding and pelleting was \$16.40 per ton.

Summary

Grinding and pelleting prairie hay increased winter gains of heifer calves 17 lbs. when a low level of supplemental concentrates was fed and 25 lbs. when fed a high level of supplemental concentrates. Pelleting increased hay consumption 2.2 lbs. at the low level of supplementation and decreased consumption 0.1 lb. at the high level. Hay required per pound of gain was reduced 22 percent in both tests. However, the increased value of the hay due to pelleting was \$4.30 and \$16.40 per ton when calves were fed a low and a high level of supplement, respectively.

Further Studies on Pelleting Rations for Steers

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Numerous experiments have been conducted to determine the feasibility of pelleting feeds for ruminants, and to determine the types of rations which are best adapted for pelleting. Several tests have shown little or no advantage from pelleting fattening-type rations, whereas pelleting high roughage rations has given marked improvement in performance.