

Effect of Time of Weaning on Winter Performance
of Hereford Calves

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Native grasses found on sagebrush-bunchgrass ranges typical of much of the high desert range area of the northwest are usually fully mature by early July and thereafter decline rather steadily in nutritive value. Wallace et al. (1961) have shown that native grasses in eastern Oregon decrease in forage quality and digestibility with increasing plant maturity. Similar results were reported by Cook et al. (1956) on native grass species in the Great Basin area. Consequently, milk production of range cows and weight gains of their offspring during the later part of the summer grazing period are usually reduced. In a study conducted by Raleigh and Wallace (1961) suckling gains in calves started to decline about mid-July under the high desert range conditions.

During certain years range operators may also be faced with a shortage of total feed late in the grazing season. Woolfolk and Knapp (1949) reported that total feed shortage could penalize the daily gain of suckling calves as much as a pound per head per day and that restricted animals still showed effects of the setback at 12 and 18 months of age. Experiments conducted by Brody et al. (1926) and Lush et al. (1930) indicated that growth in weight was more limited by nutritional factors than was skeletal growth.

Perhaps if range calves are weaned before encountering a period of reduced performance they could more readily adjust to the change in nutrient intake which occurs at weaning and thereby maintain a more continuous growth rate. In a study conducted by Green and Buric (1953) beef calves were weaned as early as 90 days of age without adverse effects. Recent data reported by Hinds et al. (1960) indicated that lambs were successfully weaned at 6 weeks of age.

The purpose of the work reported in this paper was to compare the post-weaning or winter performance of calves weaned in mid-September with that of calves weaned in mid-October.

EXPERIMENTAL PROCEDURE

The effect of time of weaning on the post-weaning or winter performance of range calves was studied over a 70-day period during the fall of 1959 and over a 208-day period during the fall and winter of 1960-61.

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1959

Twenty head of uniform calves were selected from the Squaw Butte Station herd and randomly allotted to 2 experimental treatments. Equal numbers of steers and heifers were assigned to each treatment. The calves assigned to treatment 1 were weaned on September 9, 1959, transported 45 miles to the station's winter headquarters, and placed on a growing ration. Calves assigned to treatment 2 were left on sagebrush bunchgrass range with their dams until October 7, 1959, then weaned and transported to winter headquarters, and placed on the same ration.

Following their respective weaning dates each treatment was grouped a ration consisting of chopped meadow hay (*ad libitum*), 2 pounds of barley, and 1 pound of cottonseed meal per calf daily. The chopped hay was weighed into covered mangers daily and refused feed was weighed at weekly intervals. The barley and cottonseed meal was fed in a separate feed bunk. Water, salt, and a salt: bonemeal mix were available to the animals in the lots.

Individual weights were taken on all experimental animals at 14-day intervals. All weights were taken in the morning after animals had been off water overnight. The experimental period extended from September 9 to November 18, 1959 (70 days).

1960-61

The experiment was repeated under the same basic procedures as indicated for the previous fall. Twenty-seven calves were assigned to each treatment and weaning dates were September 15 and October 18, 1960. The experimental period extended from September 15, 1960 to April 12, 1961 for this study. Feeding and weighing practices were the same as followed the previous year.

All data was analyzed according to procedures described by Snedecor (1946).

RESULTS AND DISCUSSION

In 1959 calves weaned on September 9 gained at a significantly higher rate ($P < 0.05$) over a 70-day period than similar calves weaned on October 7 (table 1). Calves weaned at the earlier date had a higher feed investment at the end of the study. However, when gains of the 2 treatments were evaluated at \$25 cwt. and feed costs deducted, the calves weaned in September returned almost \$1.00 per head more than calves weaned at the later date.

During the fall of 1960 calves weaned on September 15 and on October 18 were 177 and 214 days of age at weaning, respectively (table 2). Weight gains were significantly higher ($P < 0.01$) for calves weaned in mid-September as compared to those weaned in mid-October. Calves weaned at the later date made limited gains in the fall but partially compensated for this by making higher gains during

the winter. The return over investment (value of gain less feed cost) was \$3.77 per head greater for calves weaned in September as compared to those weaned in October.

Table 1: Performance of calves as influenced by time of weaning - 1959

Item	Time of weaning	
	Sept. 9	Oct. 7
No. calves per treatment	10	10
Age at weaning (days)	169	189
Av. weight, Sept. 9 (lb.)	312	296
Av. weight, Nov. 18 (lb.)	399	359
Av. daily gain by periods (lb.)		
Sept. 9 to Oct. 7 (28 da.)	1.36	1.00 ^{1/}
Oct. 7 to Nov. 18 (42 da.)	1.17	0.83 ^{1/}
Sept. 9 to Nov. 18 (70 da.)	1.24	0.90 ^{1/}
Av. gain per head--Sept. 9 to Nov. 18 (lb.)	87	63
Av. feed cost per head ^{2/} (\$)	11.06	6.01
Value of gain @ \$25 cwt., less feed cost (\$)	10.69	9.74

^{1/}Significantly lower ($P < 0.05$) than calves weaned in September.

^{2/}Feed costs used: Meadow hay \$20 per ton, barley \$50 per ton, and cottonseed meal \$70 per ton.

The average accumulated weight for calves on both experimental treatments over the 208-day period during 1960-61 is shown in figure 1. Although the calves weaned at the later date averaged 10 pounds heavier on September 15, they were 24 pounds lighter by April 12 than calves weaned at the earlier date.

During both years of the study the early-weaned calves adjusted to the weaning transition period more readily and went on feed more quickly than those weaned approximately a month later.

Under conditions imposed in these studies the results indicate a definite advantage in weaning calves prior to periods of severely depressed performance during the later part of the grazing season. Perhaps in some cases, the small amount of milk produced by range cows late in their lactation period limits forage intake of the calf to a point where calf performance is inhibited.

Table 2. Performance of calves as influenced by time of weaning - 1960-61

Item	Time of weaning	
	Sept. 15	Oct. 18
No. calves per treatment	27	27
Age at weaning (days)	177	214
Av. weight, Sept. 15 (lb.)	370	380
Av. weight, April 12 (lb.)	618	594
Av. daily gain by periods (lb.)		
Birth to Sept. 15	1.67	1.66
Sept. 15 to Oct. 26	0.84	0.41 ^{1/}
Oct. 26 to Nov. 30	1.51	0.63 ^{1/}
Nov. 30 to Feb. 15	1.01	1.16 ^{2/}
Feb. 15 to April 12	1.50	1.55 ^{1/}
Sept. 15 to April 12 (208 days)	1.19	1.03 ^{1/}
Av. gain per head--Sept. 15 to April 12 (lb.)	248	214
Av. feed cost per head ^{3/} (\$)	36.29	31.51
Value of gain @ \$25 cwt., less feed cost (\$)	25.76	21.99

^{1/}Significantly lower ($P < 0.01$) than calves weaned in September.

^{2/}Significantly higher ($P < 0.05$) than calves weaned in September.

^{3/}Feed costs used: Meadow hay \$20 per ton, barley \$50 per ton, and cottonseed meal \$70 per ton.

SUMMARY

The effect of time of weaning on the winter performance of calves was studied over a 70-day period in 1959 and over a 208-day period in 1960-61.

Calves weaned in mid-September gained at a significantly higher rate as compared to similar calves weaned approximately a month later. When weight gains were valued at \$25 cwt. and feed costs deducted, early-weaned calves showed a higher return. Suckling gains made by calves during the later part of the grazing season were limited.

It appears that range calves may adjust to weaning more readily if they are weaned prior to the period of reduced performance brought about by low forage quality and reduced milk flow.

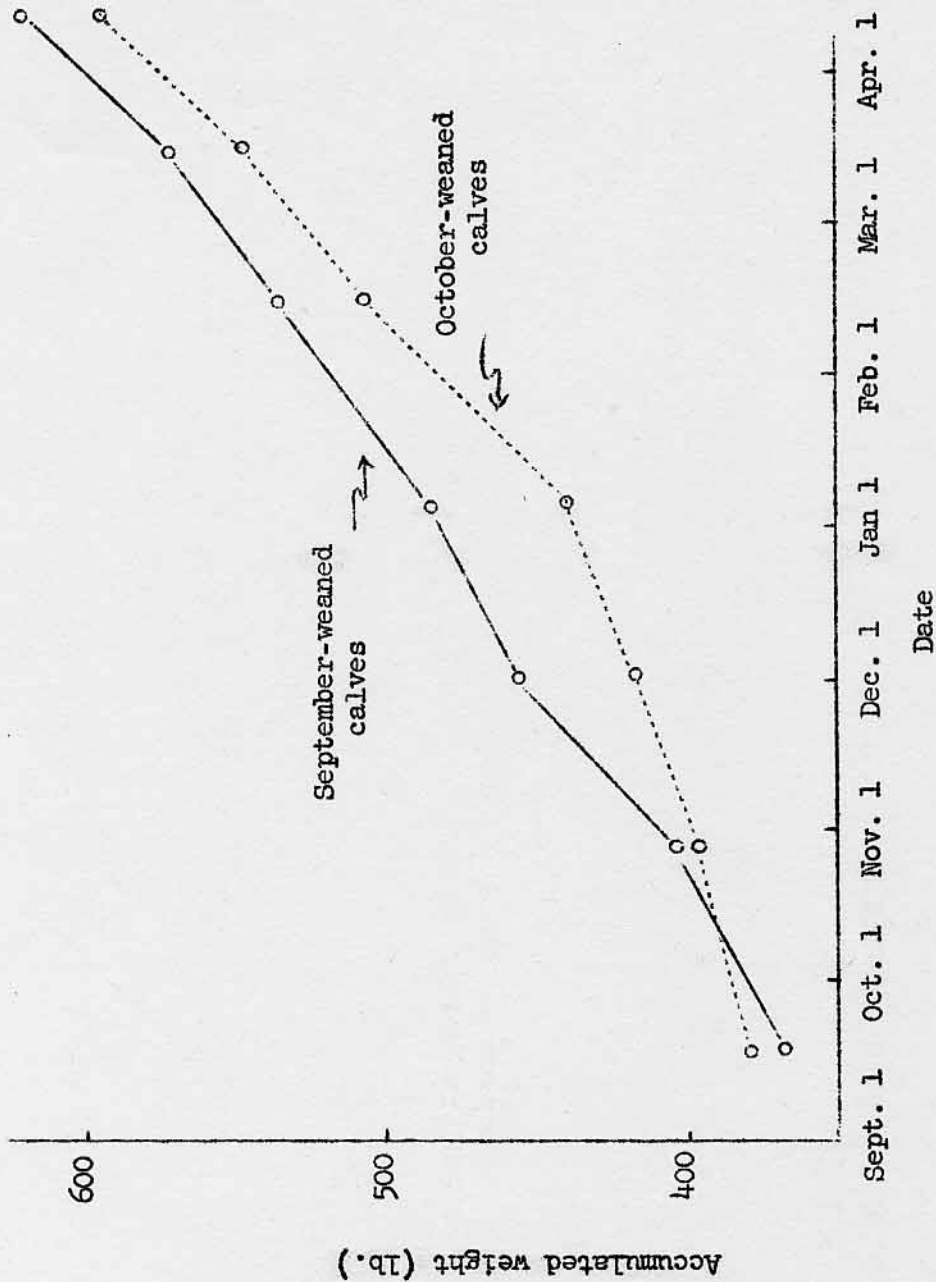


Figure 1. Average accumulated weight of calves weaned in September and in October over a 208-day period (1960-61).

LITERATURE CITED

- Brody, S., A. G. Hogan, H. L. Kampter, A. C. Ragsdale, and E. A. Trawbridge. 1926. Growth and development. 1. Quantitative data. Mo. Agr. Exp. Sta. Res. Bul. 96.
- Cook, C. Wayne, L. A. Stoddart, and Lorin E. Harris. 1956. Comparative nutritive value and palatability of some introduced and native forage plants for spring and summer grazing. Utah Agr. Exp. Sta. Bul. 385.
- Green, W. W. and J. Buric. 1953. Comparative performance of beef calves weaned at 90 and 180 days of age. J. Animal Sci. 12:561.
- Hinds, F. C., M. E. Mansfield, and J. M. Lewis. 1960. Early weaning of lambs: A comparison of lambs weaned at six and nine weeks of age. J. Animal Sci. 19:1306 (Abstract).
- Lush, J. L., J. M. James, W. H. Dameron, and O. L. Carpenter. 1930. Normal growth of range cattle. Tex. Agr. Exp. Sta. Bul. 409.
- Raleigh, R. J. and Joe D. Wallace. 1961. Research in beef cattle nutrition and management. Ore. Agr. Exp. Sta. Misc. Paper 106.
- Snedecor, G. W. 1946. Statistical methods. Iowa State College Press, Ames, Iowa.
- Wallace, Joe D., C. B. Rumburg, and R. J. Raleigh. 1961. Evaluation of range and meadow forages at various stages of maturity and levels of nitrogen fertilization. Wes. Sec. Amer. Soc. of Anim. Prod. 12:LXV.
- Woolfolk, E. J. and Bradford Knapp, Jr. 1949. Weight and gain of range calves as affected by rate of stocking. Mont. Agr. Exp. Sta. Bul. 463.