

SUPPLEMENTATION OR EARLY WEANING FOR RANGE BEEF CATTLE

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A maximum reproductive rate under range conditions is the most important consideration in a cow-calf herd. Although there are interrelationships between each successive reproductive cycle, probably the most critical stage involves the breeding performance of the first-calf heifer for her second calf. Among the more important factors influencing fertility during this period are 1) how early conception occurred during the previous (first) breeding season, 2) current nutritional status and, 3) level of lactation.

Studies were conducted with a range herd of registered Herefords owned and managed by the San Carlos Apache Indian Tribe to determine the effects on reproductive performance of 1) supplemental feeding prior to and during the breeding season of virgin and first-calf beef heifers on the range and 2) early-weaning calves from first-calf heifers on the range.

EXPERIMENTAL METHODS

The San Carlos Apache tribal herd is maintained approximately 60 miles east of Globe, Arizona at an elevation of 5,000 feet. Range forage consists primarily of desert grassland vegetation. Average annual rainfall is approximately 14 inches with a range in mean temperature from 45°F in January and to 84°F in July.

During each of two consecutive years, approximately 100 two-year-old virgin and 100 three-year-old first-calf heifers were allotted to six single-sire pastures 30 days prior to the breeding season (May 1 to August 1). Breeding pastures were originally designed to minimize differences resulting from forage and water availability. Approximately equal numbers of each age group were allotted to each pasture. In both years two pastures were allotted to each of the following treatments: control, supplementation or early-weaning. The number of cattle in each pasture was based on quantity of available forage. The supplement was pelleted and consisted of the following ingredients: 62% milo, 31% cottonseed meal, 5% molasses, 1% dicalcium phosphate, 1% salt and 10,000 I.U. vitamin A per pound of supplement. Feeding was initiated 2-4 weeks prior to the breeding season and continued for 90 days. The pellet was fed on the ground three times weekly at a rate equivalent of 5 lb. per animal daily. Calves in the early-weaning groups were weaned at an average of 70 to 80 days and placed in drylot on a self feeder.

Weights and condition scores were obtained prior to and following the supplemental-feeding period for virgin heifers in 1970 and for both age groups in 1971. Condition was subjectively rated, with higher values indicating better condition. A score of 6 is considered optimal and 4 adequate condition for normal reproductive performance. Reproductive performance was evaluated by percentage of calf-crop born and average day of birth during the subsequent year.

RESULTS AND DISCUSSION

Results of the first-year study are presented in Table 1. Availability of range forage was considered average

Table 1. Influence of Supplementation and Early Weaning, Normal Year

Heifer Age at Breeding	Item	Treatment			
		Control	Supplement	Early Weaning	Average
2	Initial weight, lb.	701	705	708	705
2	Weight change, lb.	190	201	176	187
2	Initial condition, units	4	4	4	4
2	Condition change, units	1	1	1	1
2	Percent calf crop at birth	79	71	81	77
3		83	73	89	82
Average		81	72	85	79
2	Average day of birth	62	84	65	70
3	(Jan. 1 = 1, etc.)	70	104	74	83
Average		66	94	69	76

during the period of this study. Weights and condition scores were obtained only from virgin heifers. Average daily gain of all groups (1.5 to 1.8 lb.) was considered excellent and all groups showed identical increases in body condition scores.

Both unsupplemented groups (control and early-weaning) had approximately an 80% calf crop born, which was substantially higher than the supplemented group. The average day of birth in the calving season, by treatments, followed the same trend. Milking first-calf heifers had a longer interval to conception than virgin heifers. This is normal and indicates the added stress imposed by the additional requirements for lactation and growth.

The results of this study indicate that supplemental feed or early removal of the

calf does not enhance reproductive performance if range conditions are adequate to provide a "flushing" effect immediately prior to and during the breeding season.

The next year's study was conducted during a period of extreme drought which had started the preceding fall. Results are presented in Table 2. Weights and condition scores were

Table 2. Influence of Supplementation and Early Weaning, Drought

Heifer Age at Breeding	Item	Treatment			
		Control	Supplement	Early Weaning	Average
2	Initial wight, lb.	648	644	646	646
3		780	745	750	758
Average		714	694	697	701
2	Weight change, lb.	18	97	11	42
3		-40	82	-44	0
Average		-11	90	-15	22
2	Initial condition, units	4	4	4	4
3		3	2	3	3
Average		4	3	4	4
2	Condition change, units	0.1	0.6	0.3	0.3
3		1.0	2.7	1.0	1.6
Average		0.5	1.7	0.7	1.0
2	Percent calf crop at birth	92	89	88	90
3		62	84	91	79
Average		77	86	90	84
2	Average day of birth	77	63	63	68
3	(Jan 1 = 1, etc.)	86	76	78	80
Average		82	69	71	74
3	(Jan 1=1, etc.)	86	76	78	80
Average		82	69	71	74

obtained from both age groups (virgin and first-calf) during this study. Initial weights of virgin heifers averaged 60 lbs. less than for the preceding year, reflecting the influence of sparse range forage on growth.

Supplemental feeding resulted in a large difference in weight gain when compared to control and early-weaning treatments. Heifers in both the latter treatments lost weight (11 and 15 lb., respectively), whereas the supplemental groups gained 90 lb. Although weight change was approximately the same for both age groups with supplement, a difference in weight change of approximately 55 lb. existed between the two age groups in the non-supplemented treatments (control and early-weaning). It is interesting to note that first-calf heifers in the early-weaning groups showed the same weight loss as control heifers that were suckling a calf.

Differences in initial-condition scores between the two age groups reflect the effects of gestation and lactation on first-calf heifers (4 vs. 3). Although both age groups had low condition scores, the influence of the drought was more evident among first-calf heifers. Changes in condition differed among treatments (control and early-weaning). The first-calf heifers showed the greatest overall improvement in condition, although their average scores were slightly less than those of virgin heifers at the end of the treatment period (4 vs. 4.5).

Virgin heifers averaged 11% higher calf crop than first-calf heifers. Supplementation did not improve calf crop percentage among virgin heifers (89% vs. 92%),

although substantial differences were noted in weight gain between the groups. Among first-calf heifers, both supplementation and early-weaning improved calf crop percentage, resulting in a 22% to 29% increase over control groups. The highest-percent calf crop in first-calf heifers was obtained from the early-weaning groups (91%). This was in spite of the fact that early-weaning heifers lost approximately the same amount of weight as control heifers, although the latter group had only a 62% calf crop. This difference apparently reflects the effect of lactation, independent of weight changes during the breeding season.

Earliness of conception during the breeding season, as measured by day of birth, followed the same general trends as percent calf crop. Both supplemental and early-weaning treatments were associated with earlier calving dates than controls. The average difference between age groups was of approximately the same magnitude as recorded in the previous year's study.

The results of these studies demonstrate that "flushing" virgin heifers does not improve reproductive performance if sufficient range forage is available to maintain body weight. In lactating first-calf heifers, weight loss during the breeding season is detrimental to fertility. If range conditions are not adequate to prevent weight loss, either providing supplemental feed to the heifer or removing the calf will result in normal reproductive performance.

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