

ESTRUS SYNCHRONIZATION AND CALVING EASE AMONG FIRST CALF HEIFERS

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Managing heifer replacements so they will calve as two year olds with a minimum of difficulty has been, and continues to be a problem for many cow-calf producers. One solution is to delay breeding and calve them as three year olds. Unfortunately, the economics of modern beef cattle production won't allow such a delay. Several management tools are available which, when combined, may be useful in getting heifers that are bred early in the calving season to give birth to live calves with a minimum of difficulty. Artificial insemination is one such tool available to cattlemen. Through its use, sires with progeny records that are known to promote easy calving and above average performance can be selected. Estrus synchronization has been shown to be an effective method for shortening the A.I. breeding season, enabling the livestock producer to concentrate his labor. Prostaglandin F₂ Alpha, a naturally occurring compound in animal systems, was released in 1980 under the direction of veterinarians and is being marketed under the trade name Lutalyse. In addition to A.I. and estrus synchronization, research at this station has shown that Longhorn bulls can be used to minimize calving difficulty. Using these ideas, a breeding management study for first calf heifers was designed with the following objectives: (1) to evaluate two methods of estrus synchronization; (2) to minimize calving difficulty by using A.I. and progeny tested sires for first service breeding and the Longhorn breed for clean-up purposes; and (3) to identify an efficient heifer management system.

In this experiment, Herford and Angus X Hereford heifer calves are being sorted into wintering groups according to the daily gain required to weigh 650 – 700 pounds or more at the start of the breeding season.

Before breeding in this trial could begin, it was necessary to determine the level of cycling activity among the heifers. In 1979, KaMaR heat detection devices and rectal palpation were both used to identify those heifers that were cycling. K-Markers were put on the heifers 30 days before the predetermined breeding date of June 1st. Each heifer was palpated at the start of the breeding season and scored as being sexually mature or immature. The heifers were then re-allotted according to wintering level and estrus activity into two breeding groups. Because too many false readings were obtained with the KaMaR devices, in 1980 sterile bulls were placed with the re-allotted heifers 30 days before breeding to measure the level of pre-breeding estrus activity.

The two breeding groups in this study were used to evaluate two different management methods for using the estrus synchronizing compound, Lutalyse. A single injection of Lutalyse is being compared with the recommended double injection.

Group One was synchronized using the single injection method. With this method, heifers are inseminated conventionally during the first five days of the breeding season. On the sixth day at 8:00 A.M. all heifers not inseminated during the first five days of breeding are given 25 mg Lutalyse. After the Lutalyse is administered, A.I. breeding is continued until 80 hours has elapsed. At that time all remaining undetected heifers were inseminated as a group. Following the group insemination and a five day waiting period, the heifers were exposed to a Longhorn clean-up bull equipped with a chin-ball marker. Group Two was synchronized with the double injection method. Using this method, two injections of Lutalyse separated by eleven days are used. None of the heifers were inseminated during the eleven day period between injections. Our abbreviated description of how each group was synchronized is shown in Table 1.

Semen from an Angus sire, Shoshone Monitor 17An50, was purchased from Minnesota Valley Breeders Assn. in 1979, and in 1980 semen from an Angus bull, Kadence Shoshone 7An47, was purchased from Select Sires, Plain City, Ohio. These sires have both been recommended by the suppliers as being easy calvers and known to transmit growth performance to their offspring.

Synchronized breeding results accumulated to date are shown in Tables 2 and 3.

Summary:

Synchronization results with first calf heifers have been variable in the two years that this trial has been in progress. Pre-breeding estrus activity in 1979 was very low following a long wintering period, and as expected conception rate was also low. Synchronization the following year was much more successful. Pre-breeding estrus activity is being monitored to better predict expected results from synchronization. Estrus activity in 1979 ranged from 10% in the single injection group to 33% in the double injection group, whereas in the second year of the study, 88% of the heifers in both groups were cycling before breeding started. Conception rate following synchronization in 1979 ranged from .5% to 19% in the single and double groups respectively, and in 1980 ranged from 46% to 58% in the single and double injection groups. The level of pre-breeding estrus activity recorded here appears to be a strong indicator of probable success or failure when deciding whether or not to invest in Lutalyse.

Calving difficulty varied with the sire used. The first Angus bull used, 17An50, produced the only calving difficulty experienced, but sired calves that performed very well. Due to the number of difficult births experienced with 17An50, we switched to another Angus bull, 7An47, which is also being promoted for calving ease and performance. No difficulty has been experienced with this bull and performance has been satisfactory.

These data are based on limited numbers and the trial is being continued. Trends are developing. However, drawing firm conclusions from this progress report should be avoided until the trial is completed.

Table 1. Design for Estrus Synchronization

Single Injection Method:	
Day of Breeding Season:	
1	
2	
Period I	
3	Inseminate normally 1 st five days of breeding season.
4	
5	
6	8 A.M. administer 25 mg Lutalyse to all heifers not inseminated during Period I.
Period II	
7	Continue breeding normally until 80 hrs. post-injection time.
8	
9	At 4 P.M. (80 hrs. after the Lutalyse injection) all heifers not inseminated during Periods I and II were inseminated as a group without regard to standing heat.
Double Injection Method:	
Day of Breeding Season:	
11 days before start of breeding season	Administer 25 mg Lutalyse.
1	The 2 nd injection of Lutalyse is given at 8 A.M. on the 11 th day, which is the start of the breeding season.
2	Inseminate normally all heifers found in standing heat until 80 hrs. post-injection time.
3	
4	At 4 P.M. (80 hrs after the 2 nd injection of Lutalyse) all heifers not inseminated during the 80 hr. period are inseminated as a group without regard to standing heat.

The heifers were placed with a Longhorn clean-up bull after a five day waiting period.

**Table 2. Synchronization Results and Partial Economics among Hereford
And Angus X Hereford First Calf Heifers**

Management Method	Single Injection		Double Injection	
Synchronization:				
	1979	1980	1979	1980
No. Head	20	24	21	24
No. cycling before Synchron.	2 (10%)	21 (88%)	7 (33%)	21 (88%)
No. showing heat before 80 hrs.	5 (25%)	19 (79%)	4 (19%)	18 (75%)
No. not detected & Insem. at 80 hrs.	15 (75%)	5 (21%)	17 (81%)	6 (25%)
No. conceiving to Synchron. Estrus	1 (.5%)	11 (46%)	4 (19%)	14 (58%)
No. Open after pregnancy test	6 (30%)	7 (29%)	3 (14%)	3 (13%)
Economics:				
Semen Cost/straw, \$	6	8	6	8
Lutalyse Cost/hd, \$	<u>5</u>	<u>5</u>	<u>10</u>	<u>10</u>
Total cost/hd, \$	11	13	16	18
Total treatment cost, \$	220	312	336	432
Cost/cow conceiving at Synchron. Estrus, \$	220	28.36	84	30.85

Table 3. Calving Difficulty, Birth Weights, and Adjusted Weaning Weights among Synchronized Hereford and Angus X Hereford First Calf Heifers

Management Method	Single Injection				Double Injection			
	1979		1980		1979		1980	
Calving Ease:								
No. Calving	20		16		20		21	
No. Calving Unassisted	18		16		17		21	
Calving Difficulty:								
A.I. Angus Shoshone Monitor 17An50 Kadence Shoshone 7An47	1 (5%)		0		2 (10%)		0	
Station Angus (A94)	1 (5%)				1 (5%)			
Longhorn	0		0		0		0	
Birth Weight:								
	Bulls	Hfrs	Bulls	Hfrs	Bulls	Hfrs	Bulls	Hfrs
A.I. Angus Shoshone Monitor E317An50	72	--			85	72		
Kadence Shoshone 520 7An47			70	67			62	63
Station Angus (A94)	73	--			67	70		
Longhorn	65	63	66	58	69	60	56	57
Adjusted Weaning Weight:								
A.I. Angus Shoshone Monitor 17An50 Kadence Shoshone 7An47	--		519 (5)	524 (5)	556 (2)	589 (2)	399 (7)	564 (2)
Station Angus (A94)	520 (2)	--			473 (3)	544 (2)		
Longhorn			404 (3)	561 (1)				
Longhorn					463 (5)	362 (6)		382 (4)