

Estrumate[®], Lutalyse[®], and Synchronate-B[®] Compared for Synchronizing Heat Cycles in Beef Heifers

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Artificial insemination affords the stockman a tremendous potential for genetic advancement if he wants to commit himself and capital to the task. Commitment to an artificial breeding program comes in many ways: study, capital investment, facilities and adherence to detail. Using synchronization compounds to group heat cycles together has proven to save time and labor but doesn't replace management; on the contrary, it intensifies management.

Scientists and the advance technology of reproduction now have four compounds available for commercial use to synchronize reproductive cycles in beef heifers. Three of the compounds Estrumate, Bovilene and Lutalyse are prostaglandins which, when given to heifers and cows with functional corpus luteums (C.L.) cause the C.L. to regress and the animals reproductive cycle starts over again, returning to heat 2-5 days later. The fourth product Synchronate-B, has a totally different mode of action by harmonally restraining a given group of animals from coming into heat until the desired time. It is a progestogen/estrogen combination that research has shown takes a nine day holding period. Upon removal , heat cycles have been shown to be tightly grouped.

For the purpose of this investigation only two of the prostaglandins, Estrumate and Lutalyse and the progestogen compound, Synchronate-B are being compared.

Previous research at this Station with the 25 mg prostaglandin compound Lutalyse has shown that a single 25 mg injection system is most economical and that highest conception rates are obtained when inseminations are done according to estrus instead of on a timed basis. Also, in a comparative study using reduced rates, Dr. Gary Williams, NDSU Reproductive Physiologist, found that synchronization results were the same when the dosage per heifer was reduced from 25 mg to 15 mg. This reduction reduced the cost of synchronization substantially.

Synchromate-B was released for use in beef and dairy heifers in the spring of 1983. One of the advantages for Synchromate-B is that it produces a very tight synchronization and was clearly shown to be a compound formulation that would truly allow cattlemen to artificially inseminate cattle without detecting heat.

Comparing these products, while using reduced dosages of Lutalyse, under field conditions is the purpose of this investigation. The different parameters measured include: The result when reduced dosages of Lutalyse are used, ease of use, number of days labor required for heat detection and handling, labor requirements needed for replacement and removal of ear implants, conception rates and overall economics of each method.

The study is now in its second year. The first year Hereford and Angus X Hereford heifers were used and the second year Hereford, Angus X Hereford, Milking Shorthorn X (Angus X Hereford), and Simmental X Hereford heifers wintered at the Dickinson Experiment Station were used.

Onset of puberty was recorded for all heifers using epididectomized marker bulls during the wintering period in drylot. The heifers were randomly allotted to one of three treatments based on age, weight, breed and number of heat cycles each had before the start of the breeding season.

Heifers in the Estrumate and Lutalyse groups were detected for heat during the five day conventional pre-synchronization breeding period. On the morning of the 6th day all heifers not inseminated during the 5 day period were given either 2 cc Estrumate or 3 cc Lutalyse intramuscularly using a 1" x 16 gauge needle. After these two compounds were given the heifers were inseminated 12-14 hours after being detected in standing heat. Sterile marker bulls were used to simplify heat detection.

On the day that detection and breeding began in the Estrumate and Lutalyse groups, heifers in the Synchromate-B treatment were implanted. The Synchromate-B system consists of an ear implant impregnated with a potent progestogen compound, norgestamet, and a 2 ml injection containing a solution of norgestamet and an estrogen, estradiol valerate. Implants and injection were made with strict adherence to the manufacturers instructions. Asepsis is very important and therefore, the ear was clipped with an animal clipper, scrubbed with detergent and nolvasan solution and further disinfected with alcohol before the implant was placed on the backside of the middle one-third of the ear. The implant remained in place for nine days and was removed the same time of the day it was installed.

Removal was done by breaking through the scab and scar tissue with a forceps. Using the forceps to grasp and a thumbnail to apply pressure on the implant, it was slid out through the hole of entry.

The implanter needle was immersed in alcohol between implantings. The 2 cc injection of norgestamet and estradiol valerate were given using a 1 $\frac{29}{11}$ " x 16 gauge needle and 2 cc hypodermic syringes.

The heifers were inseminated once and placed with clean-up bulls for a total breeding season of 50 days.

The data has been summarized by year in tables 1 and 2. The combined results are shown in table 3.

Summary

Comparing systems, Synchronate-B was much easier to use since no heat detection was required. Using the prostaglandins Estrumate and Lutalyse required heat detection but it didn't require catching each heifer individually in a squeeze chute to install and remove implants. Each program has its strengths and weaknesses.

Conception rates changed very little for the Lutalyse and Synchronate-B groups between years. The first year these two products had conception rates of 56.5% and 52.2% respectively. In the second year Synchronate-B's rate increase 2% and Lutalyse conception increased 1.3%. Conception with Estrumate increased significantly between the first and second years from a low of 47.8% to 63.6%, a 15.8% increase.

Using required dosages for Lutalyse, under the conditions of this experiment, has not been detrimental to conception, but lowered the cost of synchronization substantially. Cost per heifer conceiving when the two years were combined was \$2.33. Estrumate cost per heifer conceiving was \$4.50. Synchronate-B's conception rate over the two year period, when compared to the prostaglandin products, is very much the same, however the convenience of not having to detect heat was very expensive costing \$14.10 per heifer conceiving.

Table 1. Estrumate $\frac{29}{11}$, Lutalyse $\frac{29}{11}$, and Synchronate-B $\frac{29}{11}$ compared for estrus synchronization in beef heifers, 1984.			
	Estrumate $\frac{29}{11}$	Lutalyse $\frac{29}{11}$	Synchronate-B $\frac{29}{11}$

No. Head/treatment	23	23	23
No. Head inseminated during 5 day pre-synchronization breeding period	6	6	---
No. head given synchronization drug	17	17	23
No. head not detected in heat and not inseminated	4	3	--- ¹
No. head having AI sired calves	11	13	12
No. head having calves sired by clean-up bull	9	5	9
No. of open heifers	3	5	2
Conception rate, %	47.8%	56.5%	52.2%
Amount of drug used/head	500 mg/2 cc	15 mg/3 cc	Implant and 2 cc injection
Cost/heifer treated, \$	4.00	2.40	7.50
Total cost/lot, \$	68.00	40.80	172.50
Cost/heifer conceiving to synchronized estrus \$ ²	6.18	3.13	14.38
¹ All heifers inseminated by appointment.			
² Value shown is for synchronization only.			

Table 2. Estrumate[®], Lutalvse[®], and Svnchromate-B[®] compared for estrus svnchronization in beef

heifers, 1985.

	Estrumate ²⁾	Lutalyse ²⁾	Synchromate-B ²⁾
No. Head/treatment	33	33	24
No. Head inseminated during 5 day pre-synchronization breeding period	14	19	---
No. head given synchronization drug	19	14	24
No. head not detected in heat and not inseminated	1	3	--- ¹
No. head having AI sired calves	21	19	13
No. head having calves sired by clean-up bull	10	13	9
No. of open heifers	2	1	3
Conception rate, %	63.6%	57.8%	54.2%
Amount of drug used/head	500 mg/2 cc	15 mg/3 cc	Implant and 2 cc injection
Cost/heifer treated, \$	4.00	2.40	7.50
Total cost/lot, \$	76.00	33.60	180.00
Cost/heifer conceiving to synchronized estrus \$ ²	3.62	1.77	13.85

¹All heifers inseminated by appointment.

²Value shown is for synchronization only.

Table 3. Combined synchronization results for Estrumate[®], Lutalyse[®], and Synchromate-B[®] when used in beef heifers, 1984 and 1985.

	Estrumate [®]	Lutalyse [®]	Synchromate-B [®]
No. Head/treatment	56	56	47
No. Head inseminated during 5 day pre-synchronization breeding period	20	25	---
No. head given synchronization drug	36	31	47
No. head not detected in heat and not inseminated	5	6	--- ¹
No. head having AI sired calves	32	32	25
No. head having calves sired by clean-up bull	19	18	18
No. of open heifers	5	6	5
Conception rate, %	57.1%	57.1%	53.2%
Amount of drug used/head	500 mg/2 cc	15 mg/3 cc	Implant and 2 cc injection
Cost/heifer treated, \$	4.00	2.40	7.50
Total cost/lot, \$	144.00	74.40	352.50
Cost/heifer conceiving to synchronized estrus \$ ²	4.50	2.33	14.10

¹All heifers inseminated by appointment.

²Value shown is for synchronization only.

[Back to 1985 Research Reports Table of Contents](#)

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