LIVESTOCK FEEDING, BREEDING, AND MANAGEMENT TRIALS
Reduced Dosage Synchronization In Beef Cows Bred Naturally

J.L. Nelson and D.G. Landblom

Introduction

Estrus synchronization in beef cows that have a normal 50-60 day post calving interval can be achieved by the injection of prostaglandin F_2a (PGF_2a) to cause luteal regression. Both a single and a double injection regimen followed by timed insemination or insemination at estrus are being recommended. Currently, 25 mg. PGF_2a I.M. per cow is the recommended dosage. In a double injection program the injections are made eleven days apart. Under current conditions this double injection program would cost the producer approximately $5.50 per cow for the drug alone. It is conceivable that the drug cost per cow could be lowered by reducing the dosage, and this would encourage more producers to utilize the product.

Research by Williams et al. (1983) showed favorable results when heifers were administered 12.5 mg. of PGF_2a I.M. as compared to the recommended dosage of 25 mg. I.M.. T.J. Flakoll and R.B. Danielson (1988) reported that yearling beef heifers administered either 5 mg. PGF_2a in the dorsal tail vein of 25 mg. PGF_2a I.M. in the hip had similar estrus activity (78.9% vs 76.5%). Previous research at this station, Landblom and Nelson (1985), indicated good synchronization of heifers with reduced rates of PGF_2a given I.M..

Based on this information, the question remained: "Would lactating beef cows respond to a reduced dosage of PGF_2a given I.V.?" It was also proposed to evaluate the breeding of the synchronized cows with bulls in order to reduce labor. If producers could synchronize their cow herds they should have earlier and more uniform calf crops that would have a better chance of heavier weaning weights because of their extra age. Those producers who are able to incorporate A.I. into the program will have the advantage of using superior genetics from progeny tested bulls.

Materials and Methods

The experiment was conducted during the 1989 summer breeding season. Seventy two lactating beef cows of mixed breeding and age with a post calving interval of at least 43 days (43-87days) were used in the trial. The cows were stratified by breed, age and post calving interval and randomly allotted to either a 8.3 mg. I.V. dosage of PGF_2a (Treatment 1) or a 12 mg. I.V. dosage of PGF_2a (Treatment 2) or a 25 mg. I.V. dosage of PGF_2a (Control). All cows received their first injection on May 24, 1989. This was followed by a second injection on June 5, 1989. Control cows were crowded into a narrow working alley and injected into the hip area using an automatic multiple dose syringe equipped with a 1.0"-16 gauge needle. Treatment 1 and 2 cows were caught in a manually operated head gate. A rope halter was used to secure their heads to the side and expose their jugular vein. Injections were made aseptically into the jugular vein using disposable plastic syringes and 1"-18 gauge needles.

Following the first injection, sterile gomer bulls wearing a Chin-ball marking harness were placed with each group to aid in estrus detection. Cows were checked for estrus three times a day. Following the second injection, a fertile, mature Charolais bull was placed with 12 cows from each treatment group. After seven days (June 12) the cows were resorted and placed in various breeding pastures for the duration of the summer. In October, the cows were pregnancy tested and cull cows sold.

Calving records were recorded on 66 cows that were in the original allotment. Those cows that calved between March 13 and March 28, 1990 were assumed to have conceived at the synchronization estrus. Cows calving after March 28 were recorded as conceiving to the cleanup bulls.

Results and Discussion

Synchronization response data is found in table 1. The percentage of cows showing estrus following the first injection varied from 29% in the Control herd to 50% in the reduced dosage Treatment 1 herd. Calving data indicate that 72.7% (16/22) of the Control cows conceived on the synchronized estrus. One cow proved to be open and two cows were sold prior to calving (not related to the trial). Using a drug cost of $15.95 per 30 ml of PGF_2a, the total drug cost for this herd was $117.04 based on 22 cows receiving two treatments. This cost calculates to $7.32 per calf conceived at the synchronized estrus.

In Treatment 1, (8.3 mg. PGF_2a I.V.), conception at the synchronized estrus was 50% (12/24). Total cost of the drug

was $42.36 for the 24 cows treated twice. This amounts to $3.53 per calf conceived at the synchronized estrus.

In Treatment 2, (12.5 mg. PGF_2a I.V.), 40.9% (9/22) of the cows conceived on the synchronized estrus. One cow was open and two cows were sold prior to calving. Total cost for the drug given twice to the 22 cows was $58.52. Based on 9 calves conceived on the synchronized estrus, cost per calf conceived was $6.50.

A ratio of 12 synchronized cows per mature bull did not appear to overtax the bull or create any breeding problems. Perhaps the fact that the cattle were housed in drylot with feed and water close at hand was helpful.

The extra handling of those cows receiving the I.V. injections undoubtedly caused more stress than those that received the I.M. injections. This could be partly responsible for the lower conception rates in Treatments 1 and 2.

Table 1. Results of reduced PGF_2a dosage synchronization in lactating beef cows.

Treatment	Control	Treatment 1	Treatment 2
Dosage of PGF_2a	25 mg.	8.3 mg.	12.5 mg.
Route of adminstration	I.M..	I.V.	I.V.
Number of cows treated	24	24	24
Dat of 1^{st} injection	May 24	May 24	May 24
Cows showing estrus	29.1%	41.6%	50%
Date of 2^{nd} injection	June 5	June 5	June 5
Number Open and sold	1	0	1
Number sold prior to calving	2	0	2
Calves born before 3/28/90	16	12	9
Calves born after 3/28/90	5	12	12

Conceiving @ sync estrus	72.7%	50%	40.9%
Calving percentage	95.4%	100%	95.4%
PGF_2a cost per herd	$117.04	$42.36	$58.52
Drug cost /calf conceived as result of treatment	$7.32	$3.53	$6.50

Summary

A double injection program was used to synchronize lactating beef cows using either a 25 mg. PGF_2a I.M. injection or a reduced dosage (8.3 mg or 12.5 mg) I.V. injection of PGF_2a. The percentage of cows exhibiting estrus following the first injection ranged from 29% in the Control to 50% in Treatment 2. Based on calving dates, 73% of the Control, 50% of Treatment 1, and 41% of Treatment 2 cows conceived on the synchronized estrus. Cost of the PGF_2a treatment per calf conceived was $7.32 in the Control, $6.50 in Treatment 2, and $3.53 in Treatment 1.

The extra stress on the cows plus the extra labor needed to administer the PGF_2a intravenously combined with the lower conception rate do not support a reduced dosage program. Although only one years's data is available, it appears that natural service can be used to breed a limited number of synchronized cows when housed in drylot.

LITERATURE CITED

Flakell, T.S. and R.B. Danielson. 1988. 5-mg PGF-2% Intramuscular for Synchronization of Beef Heifers. Dept. of Animal & Range Science, Annual Report, NDSU, Fargo, ND 58105. pp 53-54.

Landblom, D. G. and J. L. Nelson. 1985. Estrumate, Lutalyse, and Synchromate-B Compared for Synchronizing Heat Cycles in Beef Heifer. Livestock Research Roundup, Dickinson Experiment Station, pp56-61.

Williams, G. L., M. L. Lund, B. S. Peterson and R. B. Danielson. 1983. 12.5 vs. 25 mg. Prostaglandin F-2% for Synchronization of Beef Heifers Using a 10 Day System. Dept. of Animal & Range Science Annual Report. NDSU, Fargo, ND pp 46-49.