

Clinical Report: Dairy Practice

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I am going to give you a potpourri of things that I have observed in my dairy practice in southern California. As most of you know, The Upjohn Company has just received clearance for their prostaglandin F2 alpha, (trade name Lutalyse) for non-lactating cattle. I want to present the first two slides and pose a question to you. I will attempt to draw some conclusions about it at the end of my talk.

I had a client that was very interested in synchronizing some dairy cattle to resume an AI program that he had abandoned some years before. To do it economically, we decided to palpate some of these cows at 45 days fresh, determine that they were properly involuted, had a corpus luteum present in one ovary and that they had no other palpable abnormalities. We then infused their uterus with 1cc or 5mg of Prostin® and bred them at 80 hours by appointment. The results of the first seventy-six head showed that we had a 26.3% pregnancy reate but we had about 93% of them that were coming in heat. (Table 1) Of course the question that my client asked (after I had assured him that this worked so well and that I had done some trial work previous to this) was; "what went wrong?" (Table 2) Some of the things we discussed were that maybe we should not have selected 45 days as the time to begin this program, perhaps 80 hours was not the correct time, was there an effect of passing a pipette through the cervix 80 hours prior to breeding? Was there an inaccurage diagnosis that the tract was normal? Were the bulls fertile, or does this drug really work? There were many questions. I am going to leave this

subject now but I would like to have you just roll it around in your mind and we will come back to it at the end of my talk.

TABLE 2

Question: Why such a low conception rate?

POSSIBLE ANSWER:

- bred too early in lactation
- bred at wrong time
- effect of pipette pre-breeding
- uterine infection
- low conception rate bulls
- drug alters fertility, etc.

I think most of you are familiar with the data out of Colorado on the effect of palpation methods, palpators, stage of palpation, etc., on fetal loss. You can see on their data that they had significant differences between palpating early pregnancy based on fluctuance alone, membrane slip, or the amniotic vesicle. Dr. Brad Sequin and others at Minnesota did their own trial involving 591 cows using a very similar but not identical protocol. They experienced 6.3, 8.1 and 9.8% attrition, or failure to calve across the three methods. In their study, statistical analyses showed that there was no significant difference between the three methods. Simultaneous to that study is the study that I did in California, where I palpated 983 cows and had almost a 10% failure to calve rate and still different data. My lowest attrition rate was with the membrane slip, highest was the amniotic vesicle with a significant difference between those two methods. (Table 3) I think the thing that I would like to throw out to you as a practice tip tonight is that we better not hang our hats on any one study at this point. I think that if you are a veterinarian that is doing a substantial amount of reproductive practice and palpation, it be-hooves you to do your own study. I suspect that there are some things that go on in the act of palpation that are not adequately described in our articles. Perhaps the methods that we use to retract the uterus or slip a membrane is different although we use the same words to say what we do.

TABLE 1
Intr-Uterine Prostin

(Synchronizaton of estrus: 1st service conception)

ADMISSION CRITERIA

- 45 + days fresh
- no palpable abnormalities
- 7 - 15 day CL present

PROTOCOL

- 1cc (5mg.) Prostin U
- breed one time at 80 hours

RESULTS

- 20 pregnant of 76 bred
- (26.3%) (93.3% in heat)

This paper was presented during the Practice Methods Session, AABP Annual Convention. San Antonio, Texas in November, 1979.

TABLE 3
Palpation Method/Fetal Attrition

	# Cows	% failing to calve	FL	M.S.	AV
Minnesota (Sequin, 1978)	591	8.0	6.3	8.1	9.8
Colorado (Ball <i>et al</i> , 1977)	929	6.4	3.8	6.0	9.1
California (Weaver, 1978)	983	9.8	10.1	6.8	12.7

Now I will probably really get into trouble. I know that Dr. John Woods felt that it was very important to keep track of fertility rates of different AI bulls. There are other people who have done much better studies than I have done and one of them is Dr. Jeff Davidson. I am sure his work will be published and I suggest that you watch for it. After reading his paper on fertility on AI bulls, I went out to one of my larger herds, (1000 milking cows) and examined first service conception rates on AI bulls. (Table 4) I don't think that I can draw any final conclusions because of limited data but just some data show that in a herd where we have no other obvious known variables there are some bulls that are receiving extensive use, that may have fertility rates markedly below some other bulls. We have a range from 22 to 62 percent. When we are trying to explain to a client why we have such a poor first service conception rate, if we have not looked at the bulls, we probably have not looked at every place that we should.

TABLE 4
First Service Fertility of A.I. Bulls

Bull Number	Number of First Services	Number Conceived to First Service	%
184	18	4	22.2
188	14	8	57.1
566	28	9	32.1
2573	28	16	57.1
2612	53	33	62.3
2669	16	9	56.3
2873	44	12	27.3

Another question that I have never seen a lot of data on is what is the effect of post-breeding infusion on the so-called normal cow. I had a client who was interested in this and he agreed to do a controlled study. We chose three drugs and no drugs as our control and attempted to evaluate the results on third or subsequent service. (Table 5) If a cow was noted to be definitely abnormal, she was not included in this study. The study included only cows that appeared to be normal but returned to third or later service. You can see that we had a conception rate among all four treatment groups of about 40%. I was not too excited about this data until I looked at the data a little more carefully. When you eliminate those services beyond the third service, the data looks quite different. We had a 61 and a 64 percent conception rate on third service following treatment with two different penicillin programs where we had a 35 and a 40 percent conception rate following treatment with diluted Lugols or no treatment at all. I theorize that by combining all the data for third and later services we have included many cows that had other non-infectious problems and never conceived, thereby obscuring a possible difference at third service only.

TABLE 5

Post - Breeding Infusion

(Effect of three different drugs at third or later service)

Treatment	Number Treated	Number Conceived	%
K-pen 1 X 10 ⁶	39	17	43.6
Pro-pen 1 X 10 ⁶	41	17	41.5
Dilute Lugols	39	15	38.5
no treatment	72	27	37.5

Post - Breeding Infusion

(Effect of three different drugs at 3rd service only)

Treatment	Number Treated	Number Conceived	%
K-pen 1 X 10 ⁶	18	11	61.1
Pro-pen 1 X 10 ⁶	17	11	64.7
Dilute Lugols	17	6	35.3
no treatment	40	16	40.0

Just so you don't go running wild treating cows, I had another client that wanted to treat everything on first service. I told him that I would give him potassium penicillin and some other miraculous drug, which turned out to be sterile water! These two treatment regimes after first service were very effective in reducing the conception rate by 10% whether we used water or drugs, (Table 6).

TABLE 6

Post - Breeding Infusion

(Comparison of treatment and control at first service)

K-pen (1 X 10 ⁶)	10 of 29 pregnant = 34.5%
Sterile water	12 of 30 pregnant = 40.0%
pre- and post-trial: no treatment	22 of 43 pregnant = 51.2%

The last thing that I want to present to you is the potential use of an electronic thermometer. In the last year or two I have used one of these very successfully on a number of ranches where we have heifer replacement programs with facilities that allow access to these animals on a daily basis in a lockup or chute situation. It has been my experience that a very good calf raiser can frequently spot a sick calf as quickly or perhaps more quickly than I, especially talking about calves in the very early stages of respiratory disease. There is further evidence that a thermometer picks them up before either of us. We use this as a screening tool on a weekly or a daily basis depending on the situation. Feeding these calves and locking them up frequently reveals apparently normal calves with extremely high fevers. I feel that we have been

very successful in getting animals on treatment promptly, detecting outbreaks that we would not otherwise detect, and preventing a few cases of respiratory disease from becoming an outbreak. An electronic thermometer facilitates taking many temperatures in a short time. You can generally get a reading that will give a "ball park" figure in three to five seconds. This enables the client to take temperatures of all animals at risk on a daily basis as part of our routine chore.

Finally, returning to the problem that I presented at the beginning, the cause of the reduced conception rate was revealed when we discontinued our synchronized breeding program and went to a conventional AI program. (Table 7) We experienced a conception rate of 28.9%. As you recall we had about a 22% conception rate on the synchronized animals. At that point, fortunately, they had already changed AI technicians and immediately were up to first service conception rates exceeding 50%. Technician incompetence is not a new phenomenon, but I threw it in here to illustrate (as Upjohn and ICI have already found out) that although there are many things that can go wrong in a

TABLE 7

SOLUTION:

- Begin conventional AI breeding
22 of 76 pregnant (28.9%)
- Change AI technician
12 of 25 pregnant (48.0%)

MORAL:

- Use of planned breeding methods requires careful planning or the program may be unfairly criticized
- Do not jump to conclusions prematurely and without data

prostaglandin breeding program, the first suspect things are going to be the drug, or your protocol, or your advice. *If we desire to avoid a lot of disillusionment with the prostaglandin, it behooves each of us to be more careful than I was in this case to ensure that the routine methods incorporated into the program are going to be satisfactory before we embark on a synchronization protocol.*



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Lutalyse
Sterile Solution
(dinoprost tromethamine)
Equivalent to 5 mg dinoprost per ml
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Sterile Solution
(dinoprost tromethamine)
Equivalent to 5 mg dinoprost per ml
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For Intramuscular Use for Estrus Synchronization
in Beef Cattle and Non-Lactating Dairy Heifers
Caution: Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.

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for estrus synchronization in beef
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exhibit estrus with a closely synchronized ovulation.

Prostaglandins are chains of fatty acids that are readily metabolized in the animal's system. Lutalyse is the tromethamine salt of the naturally-occurring prostaglandin F2 alpha. As a naturally-occurring compound, metabolic pathways already exist to handle its metabolism and excretion. Prostaglandin F2 alpha is natural and occurs in all mammals and man.

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Lutalyse[®]

(dinoprost tromethamine)

Veterinary

For intramuscular use for estrus synchronization in beef cattle and non-lactating dairy heifers.

DESCRIPTION

This product contains the naturally occurring prostaglandin F₂ alpha (dinoprost) as the tromethamine salt. Each ml contains dinoprost tromethamine equivalent to 5 mg dinoprost, also, benzyl alcohol, 9 mg, and water for injection, q.s. When necessary, pH was adjusted with sodium hydroxide and/or hydrochloric acid. Dinoprost tromethamine is a white or slightly off-white crystalline powder that is readily soluble in water at room temperature in concentrations to at least 200 mg/ml.

INDICATIONS AND INSTRUCTIONS FOR USE

For Intramuscular Use for Estrus Synchronization in Beef Cattle and Non-Lactating Dairy Heifers. Lutalyse (dinoprost tromethamine) Sterile Solution is indicated for its luteolytic effects in beef cattle and in non-lactating dairy heifers. Lutalyse is used to control the timing of estrus and ovulation in estrous cycling cattle that have a corpus luteum.

WHICH COWS AND HEIFERS WILL RESPOND TO LUTALYSE

Lutalyse is effective only in those normally estrous cycling animals having a corpus luteum, i.e., those which have ovulated at least five days prior to treatment. Lutalyse programs call for two injections 10 to 12 days apart. This avoids the need to consider the animal's precise day of the estrous cycle. Animals in a group situation that are not having estrous cycles will not be harmed by Lutalyse injection.

Many factors contribute to success and failure of reproduction management, and these factors are important also when time of breeding is to be regulated with Lutalyse. Some of these factors are:

1. Physical facilities must be adequate to allow cattle handling without being detrimental to the animal.
2. Nutritional status must be adequate prior to and during the breeding season as this has a direct effect on conception and the initiation of estrus in heifers or return of estrous cycles in cows following calving.
3. Cattle must be ready to breed—they must be estrous cycling and must be healthy.
4. Estrus must be detected accurately if timed AI is not employed.
5. Semen of high fertility must be used.
6. Semen must be inseminated properly.

A successful A.I. program can employ Lutalyse effectively, but a poor A.I. program will continue to be poor when Lutalyse is employed unless other management deficiencies are remedied first.

USE PROGRAMS ARE:

Program I—Estrus Observation

1. Inject 5 ml Lutalyse intramuscularly (25 mg dinoprost).
2. Repeat the injection 10 to 12 days after the first injection, then.
3. Observe for estrus after the second injection, and
4. Inseminate at the usual time relative to detection of each estrus following the second injection.
5. If the cattle are estrous cycling estrus is expected to occur 2 to 5 days after second injection. Cattle that do not become pregnant to that breeding will be expected to return to estrus between days 21 and 27 after the second injection.

Program II—Timed AI

1. Inject 5 ml Lutalyse (25 mg dinoprost) intramuscularly.
2. Repeat the injection 10 to 12 days after the first injection, then.
3. Inseminate about 80 hours after the second Lutalyse injection without estrus detection or observation.
4. Cattle that do not become pregnant to that breeding will be expected to return to estrus between 21 to 27 days after the second injection.

Experimental data have demonstrated that pregnancy rates at 2 to 5 days after second injection in Program I and Program II, were markedly greater than pregnancy rates for contemporary controls. However, due primarily to the mechanics of Program 2 there was an increase in services per conception.

WARNINGS

Not for human use.

Women of child-bearing age, asthmatics, and persons with bronchial and other respiratory problems should exercise extreme caution when handling this product. In the early stages, women may be unaware of their pregnancies. Dinoprost tromethamine is readily absorbed through the skin and can cause abortion and/or bronchospasms. Direct contact with the skin should, therefore, be avoided. Accidental spillage on the skin should be washed off immediately with soap and water.

PRECAUTION

Do not administer to pregnant cows, as abortion may result.

Do not administer intravenously (I.V.), as this route might potentiate adverse reactions.

ADVERSE REACTIONS

1. The most frequently observed side effect is increased rectal temperature at a 5x or 10x overdose. However, rectal temperature change has been transient in all cases observed and has not been detrimental to the animal.
2. Limited salivation has been reported in some instances.
3. Intravenous administration might increase heart rate.

DOSAGE AND ADMINISTRATION

Lutalyse (dinoprost tromethamine) is supplied at a concentration of 5 mg dinoprost per ml. Lutalyse is luteolytic in cattle at 25 mg (5 ml) administered intramuscularly. As with any multidose vial, practice aseptic techniques in withdrawing each dose. Adequately clean and disinfect the vial closure prior to entry with a sterile needle.

HOW SUPPLIED

Lutalyse (dinoprost tromethamine) Sterile Solution is available in 10 ml vials.

CAUTION

Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.

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