

Application of Prostaglandin (D-Cloprostenol) treatment in proestrus in Holstein dairy herds

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INTRODUCTION

The rich scientific literature of Prostaglandin F₂alpha (PGF) for oestrus induction-, and synchronisation in single or repeated luteolytic dose, shows a huge routine experience. In the course of a usual PGF treatment the estrus-ovulation becomes on the 72 - 96 hours after the treatment, if the treated animal is on the days 6 to 16 of cycle, i.e. one of the ovaries has a functionally active corpus luteum with minimum 20 mm in diameter (CL2).

In the case of rectal examination the treatment of PGF of the cows found in proestrus (on the days 17 to 20 of cycle) used to be generally postponed with 10 to 14 days. Meanwhile the oestrus signes of the majority of these cows are failed to detect

MATERIALS AND METHODS

Lactating Holstein cows from two different commercial dairy farms (counting 400 and 1800 cows) in Hungary were used in the study. These herds had rolling herd averages of 7 000 to 9 000 kg of milk per lactation. Between 50 to 60 days after calving rectal palpation was made and the cows, which had a CL2 on one of the ovaries, were included into the experiment (except of suffering from genital, udder or hoof disorders). Animals received PGF injection i.m. 2 ml (Genestran[®], D-Cloprostenol 75 µ/ml) (1st PGF). After 20 to 22 days (Days 17 to 19 of cycle) the existence of CL3 was checked by rectal palpation. Cows were divided into 2 groups according to their identification number.

RESULTS

It is clearly visible, that in the examination group **52,8%** of the treated cows **shown oestrus symptoms** (48hOe) during rectal palpation after 48h of the treatment (Table 1.) In the control group this was in only two cases detectable (4,3%). The insemination, conception and pregnancy data are summerised in Table 2-4. The insemination rate (IR) in examination group was **extremely high (69,8% vs. 19,1%)**.

TABLE 1. Oestrus symptoms after 48h of the treatment

	Control group n = 47		Examination group n = 53	
	n	%	n	%
48hOe	2	4,3%	28	52,8%

TABLE 2. Insemination rate (the ratio of inseminated cows and the number of group)

	Control group n = 47		Examination group n = 53	
	n	%	n	%
48h AI	2	4,3	20	37,7
72h AI	6	12,8	17	32,1
96h AI	1	2,7	0	-
Total	9	19,1	37	69,8

The **absence of inseminations** in control group was much more higher (**80,9% vs. 30,2%**) then in examination group. More than **97%** of animals of controls was **not detected** in oestrus and in only one case could we get information about the status of not detected animals. In examination group was diagnosed endometritis (62,5%), cystic ovary (18,8%), post ovulation (6,3%) and in one case accidental follicle ripping.

DISCUSSION

This study showed clearly that our former finding has been repeated as the insemination rate of control cows proved to be very low. It could be caused by the poor oestrus signs, also the low efficiency of the detection as well as the shorter or longer luteal phase or rather cycle length than normal, and so forth. Contrary to this poor result the D-Cloprostenol treatment during proestrus **seemed to efficient to increase the number and rate of inseminations**. However we did not get clear answer to the real effect to conception. Many of treated cows **showed oestrus symptoms about 48th** hours following treatment, the majority of them was inseminated and their **conception rate was similar** to other groups. So it is very important to know, that cows

after rectal diagnosis. During our regular examinations of Hungarian dairy herds, we usually found, that only 20 to 25 (or less) percent of such cows in proestrus could be inseminated despite of intensive detection of well predictable estrus.

Only limited information are available about the reaction of the late, regressive (some 15 mm in diameter) corpus luteum (CL3) to the PGF treatment. The luteolysis has been proceeded faster, so these animals ovulate before the 3rd day, hereby their AI usually drops out.

The aims of this study were to check (1) the effect of the PGF given on days 17 to 19 of estrus cycle on insemination rate and pregnancy rate, and (2) finding the best time of effective AI and (3) reducing the faults of oestrus detection.

• **Even group (examination)** was treated with D-Cloprostenol (Genestran[®], D-Cloprostenol 75 µ/ml) (2nd PGF) in proestrus and was detected intensively for estrus on the continuing 1 to 4 days, but after 48 and 72 hours a rectal estrus control was conducted. In case of estrus - palpation of preovulatory follicle, corpus luteum (regressed, small) and uterus (tone, mucus) - GnRH injection i.m 1 ml (*Depherelein inj.* 50 g D-Phe⁶-LHRH) was given and the cow was inseminated.

• **Odd group (control)** was asked for strictly estrus detection during the following 1 to 4 days and in case of estrus behaviour, after rectal estrus control and GnRH injection, the cow was inseminated.

Data were collected for insemination rate, day of insemination and conception rate. The pregnancy rate was also calculated. If cows could not be inseminated, the diagnosis (not detected, cystic ovary, endometritis etc.) was also detected.

The IR after 48h (48h AI) was a bit higher, than after 72h (72h AI) (37,7% and 32,1%). In the control group the most inseminations was made after 72 hours and only in this group has to be inseminated in the 96th hour (one case, 2,1%). The conception rate was similar in the two groups, but in fact, the number of inseminated cows in control group were very low (9). **Pregnancy rate (PR) showed significant difference**. It is more than three times higher in examination group (**30,2%**) than in control group (**8,5%**).

TABLE 3. Conception rate (the ratio of pregnant cows and the inseminated cows of group)

	Control group n = 47		Examination group n = 53	
	n	%	n	%
48h AI	0/2	-	8/20	40,0%
72h AI	4/6	66,7%	8/17	47,1%
96h AI	0/1	-	0/0	-
Total	4/9	44,4%	16/37	43,2%

TABLE 4. Pregnancy rate (the ratio of pregnant cows and the the number of group)

	Control group n = 47		Examination group n = 53	
	n	%	n	%
PR	4	8,5%	16	30,2%

could be in heat in **considerable ratio about 48th hour after treatment with PGF in proestrus**.

The advantage of the treatment is double. In one hand it gives a possibility to widen number of animals, which could be treated with single injection of PGF (on the days 6 to 16 of cycle) **supporting the estrus detection**. In this way cows in proestrus at the diagnosis are able to inseminated in required number and time. On the other hand it provided a good occasion to diagnose such hidden genital disorders as endometritis, cystic ovaries and so one. Due to PGF injection in proestrus these animals **could be treated whitout further loss of time an becoming more serious and chronic**.

Additional studies should be conducted to find out whether Prostaglandin F₂alpha in proestrus has a positive effect on conception or benefits come from the better oestrus exploration. Also should be compared the efficacy, cost, claim of hand work and reliability with other methods for oestrus detection or ovulation induction-synchronization (heatmount detector, pedometer, presynh, ovsynch etc.)

Despite of these open questions **the method of D-Cloprostenol treatment extended to proestrus is an effective and economic for improving the insemination as well as pregnancy rate** and increasing the reproductive performance. PGF products are wide-spread, safe, economic and easy applicable.