

RESEARCH ON THE DYNAMICS OF UTERINE INVOLUTION IN COWS TREATED WITH CLOPROSTENOL

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Abstract

The aim of this study was to observe the effect of cloprostenol administration on the puerperal period development to 60 cows (30 Holstein Frisian and 30 Red Holstein). The protocol consisted in administering the first dose (2 ml Proliz) in the first 6 hours after calving and repeating it on the 11th day. In animals whose placenta was not removed in the first 12 hours after calving, manual extraction and treatment with oxytetracycline-based cartouche were performed. Starting with the 5th day after calving, the dynamics of the uterine involution was evaluated by transrectal examinations at 7-day intervals. Placental retention was recorded in 21.66% of all studied cows. Uterine involution ended at 19 days for 20% of the cows, observing also that there was not a placental retention. To the majority of the cows (71.66%), the uterine involution ended within 26-33 days after calving. It was noticed that to the cows with placental retention, the uterine involution ended within 33-40 days after calving. In the first two months after calving, 75% of the herd was inseminated, attaining a good conception rate (62.50% for cows with placental retention and 67.56% for those without retention). In conclusion, the application of this protocol for monitoring the puerperal period ensured the sexual cycles renewal and the cows insemination in an optimal time from a biological and technological point of view to 2/3 of the herd.

Key words: puerperal period, cow, cloprostenol

INTRODUCTION

Placental retention is considered an accident in the puerperal period that may affect between 2 and 40% of cows, or even 3 and 60%. The increase in frequency is associated with pathological factors (such as, dystocia, mastitis, etc.), poor nutrition, lactation, cold season [8,10,15] stress [12]. About 50% of retention cases are followed by endometritis [3,7], and this pathological condition causes decreased efficiency in farm management. As a result, the service period length, the number of artificial insemination / gestation and the calving interval increase, and the conception rate decreases [11], all this meaning economic losses.

For example, in the US, the losses caused by placental retention in Holstein Friesian

cows have been estimated at \$ 285 per case [5].

To avoid the puerperal period prolongation, it is necessary to prevent and treat the placental retention. It is well known that an increased level of prostaglandin F₂ alpha immediately after calving may lead to the placental abruption and also, stimulates the uterine involution [13].

One way to optimize the uterine involution duration by treating the placental retention is the hormonal therapy based on prostaglandin F₂ alpha administration, associated with antibiotic administration which may be local or general [2].

PGF-based treatment is used to tone the uterus and to reduce the recovery period in endometritis, in maximum 60 days after calving [1]. Using the prostaglandin in the first 4 hours after calving may reduce the placental retention frequency by about 6% [10].

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Taking this into account, the aim of the study is to observe the dynamics of uterine involution to cows with placental retention and that were treated with PGF.

MATERIAL AND METHOD

The research was done on 60 cows (30 Holstein Frisian breed- HF and 30 Red Holstein breed- RH) during May- October. The cows had between 2 and 6 calving and the milk production varied within 6000- 8500 l.

To all the cows, in the first 6 hours after calving was administered I.M. a dose of 2 ml Proliz which contains 250 µg cloprostenol / ml – the synthetic equivalent of prostaglandin F2 alpha (PGF). If the placenta was not removed within the first 12 hours naturally, it was done manually followed by a treatment with oxytetracycline-based foaming cartouches. The second injection of PGF was given to all the cows on the 11th day after calving, regardless of the fact that placenta was removed spontaneously or after surgery. Starting with the 5th day, at 7th day interval, was performed a gynaecological control by transrectal examination to assess the dynamics of the uterine involution. There were assessed the uterus dimensions, the uterine wall consistency, the reactivity to palpation and the ovaries condition.

The research objectives were the following:

- the dynamics of foetal appendages elimination;
- the uterine involution dynamics;
- the resuming of sexual cycles activity after calving dynamics;
- the conception rate calculated as the ratio between the number of gestating cows after first insemination and the total number of the inseminated cows.

RESULTS AND DISCUSSIONS

Out of the total of 60 cows, 13 suffered from placental retention, which represent 21.66% (23.33% for HF cows and 20.00% for RH cows). The value of retention was high, yet being within the limits cited by other researches: 21% [9]; up to 43% [14], between 2% and 40% [5], 3% and 60% [4].

The highest frequency was recorded to primiparous (42.85%) (table 1), contrary to the other researchers' observations [9, 10].

Table 1 The frequency of placental retentions depending on the calving's numbers

The calving	Total Cows (no)	Cows with placental retention	
		No	%
I	7	3	42.85
II	15	3	20.00
III	19	4	21.05
IV	14	1	7.14
Over IV	5	2	40.00
Total	60	13	21.66

The overall analysis performed on the whole herd regarding the uterine involution, following the observation protocol and the treatments applied, shows that to 2 cows (3.33%), the discharges stopped early, at 12 days, but, the uterine involution was complete in 33 days. This was due to the fact that the cows were to the fourth calving and uterine muscles' fatigue induced a slowing in the uterine involution.

To the control done in the 19th day after calving, the uterus was reverted to 12 cows (20%), all of them without placental retention. After another 7 days, 28 more cows finished their uterine involution process, also without placental retention. Approximately one month after calving, the cows with placental retention started to finish their uterine involution. Thus, to 33 days after calving, another 15 cows were recovered, 8 of them being with placental retention (61.53% from a total of 13 cows) (table 2).

Table 2 Uterine involution analysis

Calving	Total	Uterine involution to 60 days after calving				
		19	26	33	40	60
I	7 (3*)	2 (28.57%)	2 (28.57%)	3* 42.86	-	-
II	15 (3*)	4 (26.66%)	8 (53.33%)	2* (13.33%)	1* (6.68%)	-
III	19 (4*)	3 (15.78%)	12 (63.15%)	3* (15.78%)	1* (5.29%)	-
IV	14 (1*)	3 (21.42%)	6 (42.85%)	4 (28.57%)	-	1* (7.16%)
Over IV	5 (2*)	-	-	3 (60.0%)	2* (40.0%)	-
Total	60 (13*)	12 (20.00%)	28 (46.66%)	15 (8*) (25.00%)	4* (6.66%)	1* (1.68%)

*- cows with placental retention

To the following controls done to 40 respectively, 60 days after calving, another 4 cows (6.66%) concluded their uterine involution respectively, one cow (1.68%), all of them falling into the category of cows with placental retention.

In conclusion, there was found out that almost a quarter of the herd (20.000%) recovered in the first 19 days after calving (table 2).

Most of the cows (71.66%) concluded their uterine involution within 26-33 days (table 2).

To all the cows with placental retention, the uterine involution was prolonged to 33 days for 61.5% of the cows, to 40 days for 30.7% and even, 60 days for 7.8% of the herd.

If there is an analysis of the uterine involution according to the cow's age (calving number), may be establish the following:

- to primiparous, the uterine involution concluded up to 33 days postpartum, even if 42.86% of them had placental retention. This aspect may be explained by the fact that, at this age, the body has a great capacity to recover;
- to cows with 2 and 4 calving, 93.3% respectively, 92.8% of them concluded their uterine involution up to 33 days postpartum;

- to cows with more than 4 calving, the uterine involution finished at 33 and over for 60% respectively, 40%;

As a general conclusion may be noticed that the uterine involution was slower to cows with more than 4 calving, and for the cows with up to 4 calving a percentage of 53.3% of them concluded their uterine involution up to 33 days postpartum.

Analysing the insemination condition, there may be noticed that out of a total herd of 60 cows, 45 (75.00%) were inseminated in the interval of 42- 60 days, 8 of them being with placental retention (61.53%).

The cows without placental retention were in heat in the first 53 days after calving in a percentage of 57.44%, and the ones with placental retention in an interval of 53-60 days (61.53%). Following the treatment, 61.53% of the cows with placental retention were inseminated and 78.73% of the cows without placental retention (table 3).

The conception rate for the studied cows was well (66.66%), even for the cows with placental retention (62.50%). This value demonstrates that the genital tract recovery was complete and the reproductive capacity restored (table 4).

Table 3 The dynamics of resumption of heat cycles after calving

Breed	Total cows	Cows in heat																				Total cows A. I.
		Days after calving																				
		42	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
Holstein Frisian	23 (7*)	1	-	1	1		1	2	1	1	2	1	1	1(1*)	2*	1	2	1		1	1*	18(4*)
Reed Holstein	24(6*)	2	1	1	-	1	1	1	2	-	1	1	2	1		1(1*)	1(1*)		1	2	2*	19(4*)
Total (no)	47(13*)	3	1	2	1	1	2	3	3	1	3	2	3	2(1*)	2*	2(1*)	3(1*)	1	1	3	3*	37(8*)
Total (%)																						78.72 (61.53)

A.I. – artificial insemination

*cows with placental retention

Table 4 Conception rate for the studied cows

Breed	Cows treated in day 0	Cow (no.)	%	Cows AI	%	Gestating cows (no)	Conception rate%
Holstein Frisian (HF)	with placental retention	7	23.3	4	57.14	2	50.00
	without placental retention	23	76.7	18	78.26	12	66.66
Total HF	-	30	100.0	22	73.33	14	63.63
Reed Holstein (RH)	with placental retention	6	20.0	4	66.66	3	75.00
	without placental retention	24	80.0	19	79.16	13	68.42
Total RH	-	30	100.0	23	76.66	16	69.56
HF + RH	with placental retention	13	21.66	8	61.53	5	62.50
	without placental retention	47	78.34	37	78.72	25	67.56
Total	-	60	100.0	45	75.00	30	66.66

CONCLUSIONS

The puerperal period follow-up protocol and the treatment with PGF resulted in the following benefits:

- spontaneous elimination of the placenta for 78.34% of studied cows;
- cows presented oestrus and were inseminated in less than 2 months after calving for a percentage of 75.00% of the studied cows;
- the gestation was noticed after the first insemination for 66.66% of the studied cows.

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