Oestrus Synchronization and Percentage of Pregnancy in Dairy Calves Using Prostaglandins by Two Via of Administration


Abstract: The oestrus synchronization allows in time fixed artificial insemination and increases the number of pregnant dairy calves; the estral cycle can be manipulated by means of the administration of F2\alpha prostaglandins by its luteolytic power. The objective of this work is to evaluate the percentage of pregnancy of synchronous dairy calves being used two via of administration of prostaglandins (PGF2\alpha), intramuscular and intravulvar. The study was held in a dairy unit in the municipality State Mexico. There were selected a total of 29 dairy calves Holstein Friesan with corpus luteum (CL) presence to the rectal palpation, the animals were divided in two groups (T1 and T2); 13 dairy calves to which an intramuscular injection of PGF2\alpha was administered to them in day 0 (Clorprostenol 530 mcg/2milliliter) and 16 dairy calves to which were administered in day 0 an injection to them to intravulvar of PGF2\alpha (Dinoprost 10mg/2ml). The diagnose of pregnancy was done by rectal palpation. It was obtained that intramuscular, T1 (77% of gestation) and T2 to intravulvar, (93% of gestation) having it via of administration IM are practical in its application although its result is not very effective in the answer to oestrus. In conclusion, the T1 where use prostaglandin (Dinoprost) by intravulvar via improved the percentage of pregnancy in comparison to the T2 with cloprostenol by intramuscular via.

Key words: Oestrus synchronization, pregnancy, dairy calves, prostaglandin.

INTRODUCTION

The oestrus synchronization allows artificial insemination planning according to a time scheme, also allows to stagger the plan parturitions beginning in a specific period of time and allows the use of the IA in animal groups in time fixed. Also allows to control and to inseminate individually (Whistles et al., 2002).

The control of oestrus in dairy calves means the that they can be inseminated with semen of superior genetic origin to the normal one, with which is increased the genetic improvement. This must remember that the good handling of the animal is essential, means to consider the lodgings, the breeds and to avoid agglomerations (Martineau, 2003). The possibility of modifying the oestral cycle through hormonal treatments has allowed to design a variety of protocols to reduce the calving interval and the first service of the IA. The control of the oestral cycle can reduce the associated problems of handling to the detection of heaths, especially in nowadays production systems where the intensification influenced negatively so that the cows show signs of estrus (Sepúlveda et al., 2003). Estrus can be induced by means of the PGF2\alpha administration (Xiang-Dong, 2003). At the nowadays time the PGF2\alpha have great importance in this activity given to that their luteolytic power and because its use has been approved and spread mainly in milk bovine (Gumen and
Seguin, 2003). The PGF₂α acid is hydroxilated, unsaturated with lutheolytic action in different species, in such a way that its action is exerted individually, when a corpus luteum or yellow body in the ovaries exists (Hirsbrunner et al., 2003). The use of prostaglandin for heaths synchronization is an excellent tool (Cavestany, 2004) also commonly is used during postpartum early to improve the uterine involution and the fertility in the milk cattle (Meléndez et al., 2004).

In fact, the prostaglandin is the natural substance produced by the uterus of the cow to cause the normal regression of the CL. Therefore, the prostaglandin injection is a way to selectively induce the regression of the CL of a way similar to the normal process. The percentage of conception with this method is similar to the one of the natural process, at least in comparison within each unit of dairy farms. This hormone was the base of the first method of heath synchronization, although the answer depends on the presence of a functional CL (day 7 to 16 of the cycle).

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The great amount of cows has created a new problem for the reproductive handling of the cows. The traditional methods for the detection of estrus are inefficient applying them in cattle ranches of great productions in where the number of cows by worker has been increased being a loss in the efficient detection from estrus. In agreement with recent studies, less than the fifty percent of the milk cows estrus was detected, being a prolonged interval between insemination and insemination and less gain for milk production (Portaluppi et al., 2003). In the cow like in other species, a total fertility is essential assuring when estrus is synchronized. The detection of estrus, in synchronous animal groups, can be difficult because many of them can display heats at the same time. It has been suggested difference of the number of cows that are in estrus (based on the aid for the heat detection and the visualization) and the real number of them (based on the determination of the progesterone concentration) can help us to explain the poor index of conception that, occasionally, are from the synchronization of estrus, in some farms; the difficulty does not have to be overestimated individually to identify the cows that are in truth estrus, in synchronous animal groups (Peters and Parsley, 2002). The estrus synchronization is considered like the stage of the estral cycle that has been applied after the detection of non pregnant cows by means of the rectal palpation or of the uterus based on the presence or absence of the corpus luteum. The importance to reduce the interval between the first and second artificial insemination has been simulated in the development of different strategies of synchronization for the return from estrus (Bartholomew et al., 2005). If prostaglandins are used in cattle that does not know its cyclical state, it can be in a percentage of pregnancy with a rank from the 30 to 70%. The main factor that contributes to this variation is the percentage of cows cycling at the moment of the treatment (Hirsbrunner, 2002). During the estrus control programs, the cattle will have to be free of stress, to have a good handling and feeding, organized the IA and to maintain severe registries, if we want to achieve success (Bernd-Alois et al., 2004).

The objective of this study was to evaluate the percentage of pregnancy of synchronous dairy calves being used two via of administration prostaglandins, intramuscular and intravulvar.

**MATERIAL AND METHODS**

A total of 29 dairy calves Holstein Friesan were selected, the selection criteria was dairy calves with presence of CL to the rectal palpation, with a corporal condition of 2,5 and 3. (Scale 1-5), with an age average of 1, 5 years with a conventional feeding, without a change of habitual handling in all. Procedure for the study, the animals were divided in two groups applying to them synthetic prostaglandins by two via which were intramuscular and intravulvar.
In treatment 1, 13 dairy calves to which an intramuscular injection of PGF2α was administered in day 0 (Cloprostenol 530 mcg/2 milliliter) which is synthetic and analogous, structurally related with the PGF2α were used. Day 0 is told like the day of application of PGF2α the dairy calves that displayed CL to the rectal palpation having to wait for 96 hours to carry out the artificial insemination (AI) in time fixed. Diagnosis of pregnancy was made by rectal palpation 45 days after AI.

In treatment 2, 16 dairy calves were administered in day 0 and injection to them to intravulvar of PGF2α (Dinoprost 10mg/2ml) with the same procedure that in the T1.

RESULTS AND DISCUSSION

In table 1, can be observed that of a total of 13 dairy calves dealt with cloprostenol intramuscular via (T1) 10 was positive to diagnose of pregnancy and that of 16 dairy calves dealt with dinoprost intravulvar via (T2) 15 they were positive to pregnancy diagnosis. In table 2, it is observed the percentage of pregnancy of T1 and T2 in where T1 obtains a 77% in comparison of the T2 that obtained a higher percentage of 93%.

Table 1: Diagnosis of pregnancy with both treatments

<table>
<thead>
<tr>
<th>Treatment (n)</th>
<th>Via</th>
<th>Product</th>
<th>pregnant ♂♀</th>
<th>empty ♂♀</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (13)</td>
<td>Intramuscular</td>
<td>Cloprostenol</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>2 (16)</td>
<td>Intravulvar</td>
<td>Dinoprost</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>25</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2: Percentage of pregnancy in both treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% of pregnancy</th>
</tr>
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<tbody>
<tr>
<td>T1</td>
<td>77%</td>
</tr>
<tr>
<td>T2</td>
<td>93%</td>
</tr>
</tbody>
</table>

The use of schemes of estrus synchronization and in time fixed artificial insemination is a practical form in units of dairy intensive production systems could improve the reproductive efficiency since one of the main problems that affect these farms is associated to the low rate of detection of estrus according to Sepúlveda et al. (2003).

The synchronization protocols that are carried out after the IA give to some advantages for the reproductive efficiency in units of milk dairy farm with a suitable detection of estrus. The protocols of synchronization of ovarian follicles and regression of the corpus luteum give to results of low levels of conception but high ranks of services compared with the protocols of estrus synchronization, which usually increase the ranks of pregnancy in herds with low ranks of detection of estrus (Cerri et al., 2004).

The protocol used in this investigation for estrus synchronization gives advantages to increase of the pregnancy rank, reduces the possibility of human error in heath detection, this can be corroborated since this protocol obtained like results a 77% in the T1 and a 93% in the T2 demonstrating that both gave high percentage of pregnancy when in time fixed insemination.

Pregnancy rank reduces to the rank on watch and the possibility of human error in heath detection; this can be corroborated since this protocol obtained like results a 77% in the T1 and a 93% in the T2 demonstrating that both gave high percentage of pregnancy when in time fixed insemination. In a study Cerri et al. (2004) obtained that the time of the artificial insemination increases the results of rank of pregnancy in the chosen cows that were inseminates under protocol, but the conception ranks were low and similar to those of the cows that insemination on cradles in the detection of estrus.

Unlike Fricke (2001) that Manipulation of the ovarian function mentions in its work that the estrus synchronization with PGF2α has been successful if the inseminated cattle in estrus detected because the rate of detection of estrus is increased and the handling of the IA is more efficient is compared with the daily detection of estrus. The results obtained in our study threw that the via of intramuscular administration was of smaller percentage in the diagnosis of pregnancy in comparison intravulvar via as the show table two. On the other hand Martineau (2003) reported that the route of PGF2α intramuscular administration is practical in its application although its result is not very effective in the answer to oestrus.

Conclusion:

In conclusion, the type of prostaglandin used dinoprost by intravulvar via improved the percentage of pregnancy in comparison of cloprostenol by intramuscular via. This supports the work that of ample way affirm that the use of schemes of estrus synchronization and in time fixed AI is a practical form in units of intensive
dairy farm systems improving the reproductive efficiency since one of the main problems that affect these herds is associated to the low rate of detection of oestrus and per sequence there is a loss in the percentage of pregnancy.

REFERENCES


