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Comparative evaluation of fertility rate in CIDR and OvSynch+CIDR treated anestrous dairy cows

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ABSTRACT

Reproduction is one of the most important issues in the dairy farms. So, there are some standards to reach the ideal production. In this survey we aimed to evaluate the CIDR and CIDR+OvSynch treatment methods in the dairy anoestrus cows. One-Hundred and fifty anestrous cows that had same body condition were divided into 3 groups. Group1 received 5ml gonadorelin. Group2 received CIDR on day-0; CIDR was removed on day-7 and 24hours later 0.5ml estradiol benzoate. Group3 received CIDR on day-0 concomitant with 5ml gonadorelin, 7 days later, CIDR was removed and 3ml prostaglandin administrated at the same time and after 24 hours were received 0.5ml estradiol. Finally, cows were inseminated artificially. Conception and pregnancy rate were recorded and analyzed. Results showed that in group-1, after 14 days, 18 were estrous so that after insemination, 8 and 10 of them were pregnant and non-pregnant, respectively. So that, fertility rate was 44.44%. Also, in group-2, 42 cows showed estrous after 14 days and 30 days after insemination, sonographic findings indicated that 15 cows were pregnant and 27 were non-pregnant. So that, fertility rate was 35.7%. Finally, in group-3, 44 of them were inseminated after 14 days, and after 30 days, 18 of them were pregnant and 26 of them were non-pregnant. So that, fertility rate was 40.9%. Our results indicated that estrous rate in CIDR group is better than gonadorelin, but the fertility was not statistically different between groups. Thus, we can conclude that use of CIDR is better than gonadorelin.

Keywords: Pregnancy, Estrous, CIDR, Gonadorelin, Artificial Insemination, Cow.

INTRODUCTION

Negative effects of an ovulation on reproductive performance of cattle have been reported during all of the last century. Detailed descriptions of cystic cows and anovular cows with small ovaries can be found in the literature from the early 1900s. In an early report, Hancock (1948) cleverly proposed that cows could be classified according to the type of *ovarian activity* into three main categories: ovulatory cows, anovulatory cows (cystic or non-cystic), and cows with *inactive ovaries* [8]. Unfortunately, in these early studies the understanding of the causes leading to the anovular condition was limited; therefore, the development of effective treatments was restricted. Today, with the help of technologies such as ultrasonography and hormone assays, we understand more about the dynamics of follicular growth and circulating reproductive hormones. This has allowed for a better evaluation of the potential underlying causes leading to anovulation as well as the development of treatments to resolve this condition.

Anestrus is generally defined as the state of ovarian acyclicity, reflected by complete sexual inactivity without manifestation of estrus [17]. True anestrus condition is associated with the presence of static ovaries, and even though there is follicular development, none of the ovarian follicles that start growing becomes mature enough to ovulate. As a result of this lack of follicular maturation, ovulation does not occur while anestrus is present [3]. Exogenous progesterone administration induces cyclicity in a substantial proportion of cows within few days of its withdrawal [5]. CIDR have been used mainly for the synchronization of ovulation and estrus [12] but are less applied for induction of cyclicity in true acyclic buffaloes

Estrous synchronization and A.I. are tools that enhance reproductive management in cattle and buffaloes and allows for more cows to become pregnant early in the breeding season. Moreover estrous synchronization improves uniformity of a calf crop [6]. Recently, it is important that effective estrous synchronization protocols are developed in order to increase the use of A.I. In addition, estrous synchronization protocols should be designed to reduce time and labor inputs by limiting cattle handlings and reducing or eliminating estrus detection [10].

The main purpose of this study was to compare fertility rate after treatment of anestrus cows by two different method (CIDR and OvSynch+CIDR).

MATERIALS AND METHODS

This study was conducted in a dairy farm with 1000 milch cows. In this farm 150 anestrus cows were selected randomly and they were divided into 3 groups each with 50 cows.

The cows in group one, received 5ml gonadoreline. The second group cows received CIDR and the CIDR was removed in 7th day and in 8th day 1mg estradiol was administered. Cows of third group received CIDR on day zero and were injected simultaneously 5ml gonadoreline and CIDR was removed after 7 days and injection of 3 ml prostaglandin was carried out simultaneously and after 48 hours they received 3ml gonadoreline and they were after 18-20 hours (after seen estrous) inseminated. At the end of the study, estrous and inseminated cows and fertility rate resulted from insemination of these cows were evaluated.

RESULTS

According to the results of the three control groups we found that:

In the group one: 50 anestrus cows received 5ml gondaoroline, the number of estrous cows reached to 8 cows after 14 days and 42 cows that were anestrus. The 8 estrous cows were inseminated and after 30 days, the diagnosis was performed by using ultrasonography, which it is demonstrated that the 3 cows are fertile and 5 cows are infertile (37.5 %fertility). Also, the average insemination to fertility was 2.66 in this group.

Group two: the cows received cider and after 14 days, 43 cows were estrous and 7 cows were anestrus, and estrous cows were inseminated. After 30 days using ultrasonography diagnosis it was demonstrated that the 16 cows are fertile and 27 cows are infertile (37.2% fertility). The average insemination to fertility in this group was 2.68.

In group three that received OvSynch+CIDR treatment all 50 cows were estrous after 14 days and all 50 cows were inseminated and diagnosis was performed after 30 days using ultrasonography. Results indicated 17 cows were fertile and 33 cows were unfertile (34% fertility), the average insemination to fertility in this group was 2.94.

The results of statistical analysis using Chi-Square showed that:

The difference between the incidence of estrus and insemination rate in group 1 and group 2 and between group 1 and 3 is very significant ($p < 0.01$). The difference between the incidence rate of estrus and insemination rate is also significant between groups 2 and 3 ($p < 0.018$). There is no significant difference in fertility rates between groups 2 and 3 ($p = 0.76$) and groups 1 and 2 ($p = 0.88$). There is no significant difference in fertility rates between groups 1 and 3 ($p = 0.65$).

There is no significant difference in insemination to fertility rates between groups 1 and 2 and between groups 2 and 3 or between groups 1 and 3.

The results of this study showed that anestrous cows treated with two methods of CIDR and OvSynch+CIDR (groups 2 and 3) show significant difference in case of estrous, but they do not show significant difference from fertility rate and also the average of insemination to fertility in anestrous cows of group 2 showed optimal conditions relative to group 3. Finally it was concluded that CIDR method used in anestrous cows of group 2 is better than OvSynch+CIDR used in groups 3 and it is economical. Since in group 2 less frozen sperm was used for insemination so it is cost effective and it needs to less time to reach goal.

In this study according to the table-1, it can be seen that of 50 cows, the 42 cows (84%) are anestrous and 8 cows are estrous (16%). In group 2 it can be seen that of 50 cows, 7 of them (14%) are anestrous and 43 cows are estrous (86%).

Table1: Number of estrus and anestrus cows in 3 different groups

Group	estrus	fertility	anestrus	unfertility
1	8	3	42	47
2	43	16	7	34
3	50	17	0	33

DISCUSSION AND CONCLUSION

According to our results it was concluded that: In group one, the number of estrous cows after 14 days was 8 cows and 42 cows were anestrous and these 8 estrous cows were inseminated where 3 cows were fertile and 5 cows were infertile (37.5% fertility). Also, the average of insemination to fertility was 2.66, in this group. In group two, after 14 days, 43 cows were estrous and 7 cows were anestrous that 43 estrous cows were inseminated and 16 cows were fertilized and 27 cows were infertile (37.2% fertility). Also, the average of insemination to fertility was 2.68, in this group. In group three, after 14 days, all 50 cows were estrous and they were inseminated. 17 cows were fertilized and 33 cows were infertile (34% fertility). Also, the average of insemination to fertility was 2.94 for this group.

Researchers in a study on anestrous cows with OvSynch + CIDR and CIDR treatment method and comparison of these methods indicated that:

The level of estrous is % 93.2 in OvSynch + CIDR, and the level of estrous is % 89.1 in CIDR, and the difference between the two groups in level of estrous is %4.1 [1]. According to the results of this research on level of estrous in both groups followings were obtained: 1 - The level of estrous is % 100 in OvSynch + CIDR, 2 - The level of estrous is % 86 in CIDR, 3 - The difference between the two groups in level of estrous is %4. The results show that although estrous level in OvSynch + CIDR treatment groups was higher than CIDR method, but this difference is insignificant. Researches indicated that the increase of progesterone concentration in OvSynch+CIDR and CIDR increase fertility in the second insemination [13]. Researchers concluded that the level of fertility with OvSynch + CIDR and CIDR is as follows [1]: In the first insemination: fertilization rate by CIDR is 30%, fertilization rate by OvSynch + CIDR is 47.3 %. In the second insemination: fertility by CIDR is 59.7%, and fertilization rate by OvSynch + CIDR is 52.9%. The total fertility rate in all inoculation: in CIDR was 67.7%, in OvSynch + CIDR was 71.3%.

We observed that the difference in fertility rates between the two methods that was used in this study is not significant for treatment of anestrous cows.

According to the previous researches results, it was concluded that the fertility rate in anestrous cows treated with CIDR and OvSynch+CIDR in second insemination is more than the fertility rate in the first insemination [1]. In a study (2005) on 20 dairy cows the researchers was reported fertility rates 65% using CIDR [9]. Ambrose and his colleagues (2005) studied the fertility of three groups of cows treated with different methods of OvSynch + CIDR [2].

In studies conducted by EL-Zarkouny *et al.*, in 2004 and also Morira and *et al* it became clear that the combined OvSynch + CIDR methods impact on improving fertility in lactating dairy cows resulted from milking [7, 11]. Bicalho and his colleagues (2007) used CIDR to reduce the percentage of cows without ovulation at the beginning of OvSynch [4]. Although a significant increase in the percentage of cycling in cows without ovulation was observed at the start of OvSynch but there was no fertility increase in insemination at constant period. According to the research of Twagiramungu and colleagues it was found that in cows treated by OvSynch + CIDR,

gonadoreline leads to simultaneous new follicular wave during removal of CIDR [16]. Studies conducted in Mexico in 2006 by Thatcher and colleagues in anestrous cows indicated that using CIDR concurrent with OvSynch improve and increases fertility rate in flock [15]. According to Stevenson and et al (2006) in a research on 634 dairy cows studied in research centers in Michigan, Ohio, Missouri, Kansas it was determined that by the techniques of OvSynch+CIDR the 89% of the cows ovulated after second GnRH injection in 48 hours [14].

CONCLUSION

Our results indicated that anestrous cows treated with CIDR and OVsynch+CIDR show significant difference from estrus level but they do not show significant difference in view of fertility rate. Also average of insemination to fertility in anestrous cows in group 2 showed better conditions than group three by anestrous cows.

It was concluded that CIDR method that was used in anestrous cows in group 2 is better than OVsynch+CIDR in cows in group 3 and it is cost effective and since in the group 2 less frozen sperm was used so it is economical and it needs to less time for achieving results.

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