EFFECTS OF BUSERELIN ACETATE ON CONCEPTION RATE IN REPEAT BREEDING DAIRY CATTLE

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ABSTRACT

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The aim of the present study was to evaluate the effect buserelin acetate given 12 days post AI and double inseminations during estrus period of dairy cattle on improvement of conception rate. Field trial was carried out on repeat breeding cross breed dairy cows which are lactating and apparently healthy that exhibits estrus regularly. A total of forty four repeat-breeding cows from twenty herds were selected and assigned randomly in to two equal groups, A and B: one treated and one control group. Group A (n=22) cattle were treated intramuscularly with 10 µg buserelin acetate 12 days post AI. Group B (n=22) cattle were inseminated once during estrus exhibition with single service and considered as control. Dairy cows were examined for pregnancy after three months through rectal palpation. Pregnancy rates recorded were 55%, and 32% in A and B respectively. The conception rates of treated group exceed control group by 23% respectively. Treated group showed a significant statistical variation ($P<0.05$) as compared to control groups. It is recommended that the use of GnRH injection 12 days post AI and can improve pregnancy rate in repeat breeding cross bred dairy cows.

Key words: Crossbred cattle, Estrus, Buserelin acetate, Pregnancy rates

Reproduction problems in dairy cattle are most frustrating to farmers and caused by several factors. *Repeat breeding* is among the most frustrating problems which are defined as cows' failure to conceive from three or more services (Royal *et al.*, 2000; Lucy, 2001 and McDougall, 2006). These are cows that cycle normally and have no clinical abnormalities after a minimum of 3 inseminations (Levine, 1999). The economic losses associated with this problem are highly considerable resulted from increased veterinary expenses, insemination costs, reduced productivity, and losses due to involuntary culling.

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Several investigations were carried out to find out possible solutions to reduce number of repeat breeder dairy cows. Some of the possible suggestions that were tried to reduce the incidence of repeat breeding were; strengthening estrus detection, embryo transfer, administration of gonadotropin releasing hormone (GnRH) at insemination and post insemination, continued AI, resynchronization of non-pregnant cows. Gonadotropin-releasing hormone analogue treatment twelve days post AI of repeat-breeding dairy cattle were also among the most suggested solutions for this problem by Stevenson *et al.* (2000). Repeated inseminations increases chances of pregnancy rate due to hidden or error of estrus detection of the dairy men.

Only few understanding was available about treatment and use of synthetic hormones for management of repeat breeding dairy cows in Ethiopia in general and in Tigray region in particular.

Nothing was done to investigate problems of repeat breeding using GnRH analogue on day 12 post AI for enhancement of conception rate of cross bred repeat breeding dairy cattle. Therefore, the present study was conducted with the aim of enhancing conception rates in cross bred cattle with specific objectives of evaluating effects of GnRH analogue (buserelin) 12 days post AI on enhancement of conception rate.

This experiment was conducted in Mekelle, capital of Tigray regional state. It is among the seven Administrative Zones located at 783 km north of Addis, geographically located 39° 29'E and 13° 3'N longitude. It has an average temperature of 20°c and experiences an average annual rain fall of 600 mm. Dairy farming is one of the most farming systems practiced in the city and small holder farmers around the city supply moderate amount of milk to urban dwellers. Some of the farmers in the nearby area practice a mixed crop livestock production system. The area is moderately covered with savanna, bushy and low weed vegetations. Both the small holder farmers and commercial dairy farms owners were included the study.

Experiment was conducted in cross bred dairy herds which were repeat breeding, owned by small holder farmers and private commercial dairy farms in the city. Study animals were kept in stall facility and feed grass hay, concentrate composed of wheat by products, locally available crop residues, forages and other locally prepared fermented alcohol by products. The cows have good body condition and apparently healthy. They had history of more than two services and milked twice per day. They were vaccinated regularly against common infectious diseases. Generally, these dairy cows were managed and kept in similar agro ecological and climatic conditions. AI was exercised based on visual observation of standing heat and mucosal discharges from vulva by herd keepers.

Randomized controlled trial was used to study effects of GnRH analogue (buserelin acetate) given 12 days post insemination for enhancement of pregnancy rates as compared to dairy herds which receive single service. The study period was from November 2009 to February 2010 Mekelle. A total of 44 dairy cows were selected from twenty farms. Cows with normal cycling, no clinical abnormalities, failed to conceive after two successive inseminations, not previously assigned for any study and aged from three to ten years were included in the study.

This experimental study consists of three main parts: In the first part, training was provided for twenty herd owners for awareness creation about symptom of estrus cycle or behavioral changes observed during estrus cycle. Some of the signs to be observed by herd owners were mucosal discharges from their vulva, restlessness, frequent urination; allow to be mounted by other animals, raised tails and others. Herd owners were informed that as soon as these symptoms were observed, they would phone to inseminator immediately and these cows were included in the study. The second phase was random assignment of these dairy herds in to two groups; control and treatment groups. The first group A (n=22) was inseminated and 10 µg (2.5ml) buserelin acetate was given intramuscularly 12 days post AI. The second group $_{B}$ (n=22) was inseminated with single service and considered as control group estrus exhibitions. The last part of the study was pregnancy diagnosis and was done after 60 days post AI using a rectal palpation in these herds which failed to return to estrus.

Difference in pregnancy proportion, age and parity among different treated groups against control one was compared using descriptive statistics and paired t-test is used to compare these two population means from the two samples in which observations in one sample can be paired with observations in the other sample using a statistical packages of SPSS 20.0; 2005). The significance level of difference was observed at P value of less than 5%.

Out of 44 dairy cows included in the study, 19 cows were found to be pregnant. A total of 12 cows from groupA were pregnant with conception rate of 55%. In the group B, 7 cows out of 22 (32%) conceived.

Management condition, season and parity variation doesn't show any significant variation in the treated groups as compared to controlled group.

Buserelin acetate treated group showed improved conception rate (55%) as compared to control group (32%) which indicates that incidence of repeat breeding can be reduced through synthetic GnRH treatment. This may be due to insufficient or defective corpus luetum development and treatment might have produced a healthy CL. This could maintain high progesterone concentration in the serum which reduces embryonic mortality in the early stages.

This result was in agreement with the study by Blowey (1992) that administration of GnRH analogue 12 posts AI improves fertility of cows by 9 % to 12 % and by Drew and Peter (1994) which was already reported. This experiment provides evidence for continued recommendation of GnRH analogue treatment 12 days posr AI to improve conception rates of repeat breeders.

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