Effect of bulls on pregnancy rate of estrous synchronized Brangus cows[1]

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ABSTRACT: The objective of this research was to investigate the effect of bulls on pregnancy rate of estrous synchronized Brangus cows. Seven Brangus bulls with average body weight of 820 kg and aged approximately five years were used in this study. A total of thirty five cows were divided into seven groups, each consisted of five cows were also used. All animals were raised in semilar grazing system and fed with approximately 5 and 2 kg/head/day of concentrates for bulls and cows, respectively. Estrous synchronization was carried out using controlled internal drug releasing devise (CIDR) containing 1.38 mg progesterone for eight days. All cows were given 2 mg oestradiol benzoate, intramuscularly during the day of CIDR insertion(day 0). The CIDR was removel after 8 days and 125 µg prostaglandin injected was intramuscularly. One day after the removal of CIDR to all cows were given 1 mg of oestradiol benzoate. Cows were observed visually for oestrus at 06.00-08.00 am, 12.00-14.00, and 16.00 -18.00 pm (on the day 10) respectively. Characterization of the oestrus response was defined as cows receiving 1-3 mounts during mixing together bull and cows. All cows were mixed with bulls with 1: 5 ratio of bull : cows for seven day. All animals were kept in a pasture herd on a separate two hectare paddock for each group. Thirty two days after mixing, pregnancy was determined using transrectal ultrasonography. The result indicated that the conception rate (CR) varied from 0.0 - 60.0 %.

Key words: bulls, estrous synchronizatioan, controlled internal drug releasing (CIDR), conception rate (CR)

INTRODUCTION

Fertility of bulls is a very important factor in cattle reproduction because a single bull is generally to mate numerous cows. Hence evaluation of male fertility prior to breeding is of paramount importance to achieve breeding success (Hoflack et al., 2006). Three mains factors that determined whether the bulls are considered fertile or not, firstly is physical soundness, secondly is good semen quality, and thirdly is good serving capacity (Barth, 2000). The problem in the traditional systems of breeding such as dominance, aggression and interference among bulls have been found affected the reproductive performance of the herd (Blockey, 1979).

Natural breeding and artificial insemination (AI) can be used for genetic improvement and population increase in cattle, as both methods has advantages and disadvantages. But in terms of natural mating the physical ability has weaknesses that males can only serve only a few females in a given time. While, AI has the advantage of having no limitation on mating females depending human applicator. In tropical regions natural mating using bulls is still the most frequent method, making the

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selection of males is one of the most important procedures in any cattle enterprise. Recently approximately 85% of cattle in tropical regions are still mated using the natural mating system (Galina and Arthur, 1991; Boyd, 1991).

Using much of these males is the sign that natural mating is still a good choice for ranchers and livestock industry to produce calves. The advantages of using bulls to produce calves is their ability to identify females in estrous state, and their capacity to mount them (Galina et al., 2007). The on number of pregnancies at the end of the mating season determined the capacity of a single bull on serving a given group of cows under natural mating conditions (Molina et al., 2000). The objectives of this study was to investigate the effect of bulls on pregnancy rate of estrous synchronized postpartum Brangus cows.

MATERIALS AND METHODS

Seven Brangus bulls aged four years and average body weight of about 800-900 kg, were used in study. A total of thirty five cows 55 - 60 days postpartum, average body weight of 550 kg, aged approximately four years old were used and divided into seven groups consisted of five cows each. All animals were managed under pasture conditions in a paddock planted with (*Bracaria decumbent, Setaria decumbent*) and fed with approximately 5 and 2 kg / head /day of concentrate for bulls and cows, respectively. The respective pasture was located in an area which was about 50 m above sea level, in the humid tropics with average temperature of 30°C and relative humidity of 87.5%.

Estrous synchronization was carried out using controlled internal drug releasing device (CIDR) containing 1.38 mg progesterone (Pharmacia Limited Company, Greenlane Auckland) (see figure 1). The device was inserted intravaginally for eight days. All cows were given 2 mg oestradiol benzoate (Cidirol, Biomac Laboratories Ltd), intramuscularly during the day of CIDR insertion (day 0). The CIDR was removed after 8 days and 125 µg prostaglandin F2 alpha (Estrumete, Estrumete, Schering-Plough Animal Health, Australia) was injected intramuscularly. One day after CIDR removal, all cows were given 1 mg of oestradiol benzoate (day 9). Cows were observed visually for oestrus at 06.00-08.00 am, 12.00-14.00 and 16.00 -18.00 pm on day 10. Characteristic of the oestrus response was defined as cows receiving 1-3 mounts during mixing bull and cows. Two days after CIDR removal (day 10) all groups were assigned to a bull (1: 5 ratio of bull: cows) for seven days.

Pregnancy Determination

Pregnancy diagnosis was conducted at thirty two days after mixing (bull and cows), all cows were detected for pregnancy by transrectal ultrasonography using an ultrasound scanner (Aloka SSD-500 Echo Camera, Japan) attached to a 5.0 MHz liner probe.

Statistical Analysis

Analysis Statistic about proportions of cows that showed estrous after estrous synchronization as well as pregnancy rates were analyzed by separate Chi-square analyses using SAS (SAS Inst. Inc., Cary, NC, USA).

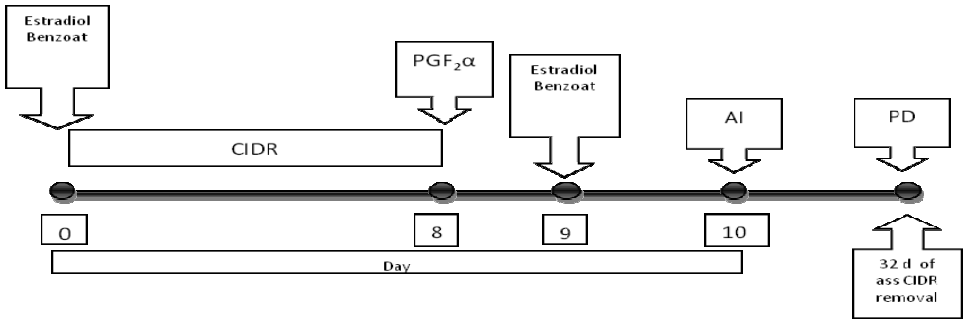

Figure 1. Schematic representation of estrus synchronization (Limited Company, Ltd, 2009)

RESULT AND DISCUSSION

Characteristics of the estrous response after removal CIDR are presented in Figure2. The result of this study showed that there was no significant differences (P>0.05) between observation at 06.00 am, 12.00 and 16.00 pm (day 10) after CIDR removal. This is in agreement with the studies reported by Zelinski et al (1980) and Busch et al (2008) who suggested that cows that exhibited oestrous after the removal of CIDR may have attained concentrations of oestradiol necessary to effectively prepare follicular cells for luteinisation. Ando et al (2004) reported, every cow showed oestrous response two to four days after CIDR removal and ovulation induction. Furthermore, Resby et al (1998) found that 80% of beef heifers treated with a CIDR for 7 days exhibited oestrus within 1 to 3 day after CIDR removal. Whereas Flores et al (2006) found 56% of cows synchronized using CIDR + prostaglandin F2 alpha exhibited oestrous during the tree days of the breeding season.

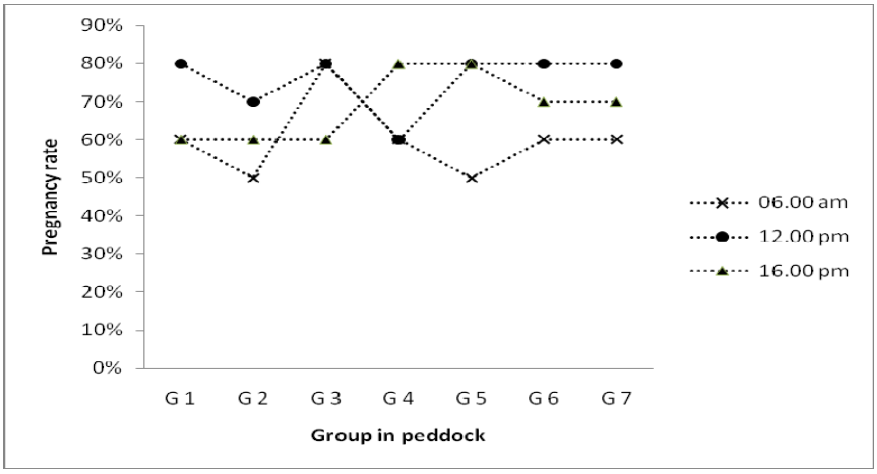

Figure 2. Comparisons of the cumulative percentage of estrous response during the estrous synchronization with CIDR protocol at different time observation.

The pregnancy rates vary from 0 – 60 % (figure 3) with average pregnancy rates of 28.5% although bulls were selected based on good record. This is in agreement with previous studies by Molina et al (2000) who found that there was no relationship between libido score and pregnancy rate. The variation of pregnancy rate in this study may be caused by many factors. Selective mating by the bull with a tendency to choose a cow for mating may contributes to the low pregnancy rate. This is in accordance to opinion that stated by Molina at al. (1997)

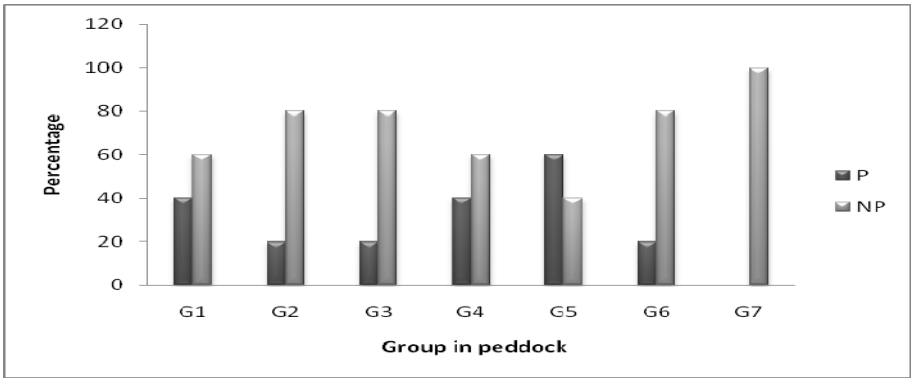

Figure 3. Comparisons of the comulative percentages of pregnant (P) and non pregnant (NP) cows during the estrous syncrnization with CIDR protocol.

Besides, the time factor for handling livestock in a mating alleged role in the process of pregnancy rates, because all of cows were placed in the paddock that could not be controlled. This is in agreement with Galina et al.(2007) who reported the bulls would be faster to serve cows in restrain compare the cows grazing in the field. Short peak of estrous in cows, was also one factor that many affects the pregnancy. it is in accordance with opinion stated by Garcia *et al.*(1986) who showed estrous peak in cattle has a short duration.

Although all cows in each group showed standing heat after estrous synchronization but the wide range of pregnancy rate could be also due to the failure of conception and early embryonic death (Jaenudin and Hafez, 2000) as a result of genetic heredity, ovarian function, uterine infection, semen quality and enviroment including nutrition. Furthemore, it was reported that other factors such as lactation anoestrous, poor body condition, erratic reactivation of ovarian activity and postpartum interval might also reduce the pregnancy rate (Molina et al., 2000).

CONCLUSION

The conclusion of our study indicate that average pregnancy rates mating by bull after estrous synchronization with CIDR protocol was 28,5%.

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