Short Communication

Effect of Two PFα Injections on Estrous Synchronization and Some Reproductive Traits during Non Breeding Season in Desert Goats

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ABSTRACT

The aim of this study was to investigate the effect of Effect of two PFα injections on estrous synchronization and some reproductive traits (Estrous response, gestation rate, gestation length, Kidding rate, fecundity rate, twins rate and postpartum period), during non breeding season. The parameters were studied using 15 desert does age between 2-3 years and managed under controlled condition. Their weights 30±2.1 kg. The results obtained revealed that there were no significant difference (P>0.05) between the groups in estrous response rate, gestation rate, kidding rate and fecundity during non breeding season. The estrus detection, estrus duration, gestation length and postpartum period were slightly shorter in treatment group than control group.

Key words: Estrous synchronization, PFα, Reproductive traits, Desert goats

INTRODUCTION

Estrus synchronization has become a vital instrument in the management of reproduction in domestic farm animals (Motlomelo et al., 2002; Fonseca et al., 2008). Its benefits include a planned breeding programme and a reduction in labor costs in terms of estrus detection and care of the newborn. (Motlomelo et al., 2002; Fonseca et al., 2008).

Estrus synchronization can play a major role in the improvement of breeding efficiency in goat throughout the year. The primary functions of synchronization protocols is to either synchronize estrus so that goat can be inseminated within 24-72 h time period or to synchronize ovulation so goat can be inseminated at a predetermined time known as a timed artificial insemination (Fatet et al., 2011). Estrus synchronization has also become an important tool for embryo transfer. (Motlomelo et al., 2002; Fonseca et al., 2008). Prostaglandin (PGFα) used synchronize estrus by terminating the luteal phase through regression of the corpus luteum, prostaglandin-based systems used only during the breeding season. Because not all stages of the estrus cycle are similarly receptive to prostaglandin treatment (Ataman et al, 2006).

The common used methods of PGFα are the first one is to use progesterone impregnated intravaginal sponges for 7 or 12 days following by a single prostaglandin injection, this method can be use in during season and anestrous season, another method is applied by two injection of prostaglandin at 11 days interval, this method can be used only during breeding season (Ataman et al, 2006).

There is no information available about the estrus synchronization during non breeding season in desert goats. The objective of this study was to evaluate the effect of two PFα injections on estrous synchronization and some reproductive traits during non breeding season in desert goats.

MATERIALS AND METHODS

Animals: Fifteen adult female desert goats healthy, cyclic aged between 2-3 years with an average body weight 30±2.1kg. The animals divided into groups, (group A consist of ten does) and (group B consist of five does) and two desert buck. All animals were apparently healthy on clinical examination, all animals were dosed against internal parasite by (Ivermectin injection- Aviomec®, Avico company, Jordan), One ml injected subcutaneous. Each group of animals was housed in semi closed pens at the farm of the Faculty of Veterinary Science, University of Nyala.

The feeding regime were based on grazing on natural pasture and supplemented with concentration (sorghum grain, groundnut cake, wheat bra) was offered on 250g per head daily.

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Treatments: All does in group A were injected with PF3α (125 mg of Cloprostenol, Estrumate®) 1ml dose intramuscular (IM) at day 0 and then repeat the same injection after 11 days interval. While all does in group B was remained natural cycle without treatment (Arthur et al., 1989).

Estrous detection and Insemination: Estrous was detected by detector owner (Visual observation method of heat detection, Observable signs of heat include mounting or attempting to mount other goat, standing to be mounted by other goat, depressed appetite, nervous and excitable behavior, vulva swelling and reddening and clear vaginal mucous discharge) in the farm twice daily (6:00 AM and 6:00 PM), after 24 h from last injection for 5 days (Britt et al., 1998). All does were showed estrous signs were recorded and served naturally by two health active desert buck (Arthur et al., 1989). Non return to oestrus was considerate as an indication for conception.

Reproductive traits
Estrous response = number of does showing signs of estrous / total of does treated × 100
Gestation rate = number of does conceived / number of does showing estrous and inseminated ×100
Kidding rate = number of does kidding / number of does inseminated ×100.
Abortion rate = number of does aborted / number of does conceived ×100
Fecundity rate = number of kids born / number of does inseminated ×100
Twins rate = number of twins born / number of does kidding ×100
Postpartum period was calculated from the date of parturition to first expressed oestrus occurrence (Hafez and Hafez, 2000).

Statistical analysis
The data obtained were presented as mean ± standard Error, data obtained were subjected to Student t-test using Graph pad Prism software version 16. Test carried out at 95% level of confidence (P<0.05).

RESULTS AND DISCUSSION
The results of estrus synchronization were presented in (Table 1). All the treated does presented in estrus. Overall, 100% estrus response was found in all treated does and control does (Table 1). Estrous response was found in control group during non breeding season, this due to male exposure in treatment group after showed estrous signs in other pen and this agree with that report by (Delgadillo et al., 2009). The time of estrus detection, estrus duration and heat period were significantly difference in treatment group than control group, this could be due to the rapid fall of progesterone in blood after luteolysis. This result is in line with that reported by (Chemineau et al., 1988), (Akusu and Egbunike, 1992) in West Africa Dwarf goats, (Ishwar and Pandy, 1992) in Black Bengal goats and (Devendra and Burns, 1983) in tropical goats.

The effect of PF3α on fertility traits show that there were no significant difference (P>0.05) between the groups in gestation rate, kidding rate and fecundity rate during non breeding season (Table 2).

Table 1: Estrous traits of desert do

<table>
<thead>
<tr>
<th>Reproductive traits</th>
<th>Treatment animals</th>
<th>Control animals</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of does</td>
<td>10</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Estrous response %</td>
<td>100(10/10)</td>
<td>100(5/5)</td>
<td>NS</td>
</tr>
<tr>
<td>Detection of estrous (HAI)</td>
<td>69.6±0.65</td>
<td>181±45.51</td>
<td>*</td>
</tr>
<tr>
<td>Duration of estrous (d)</td>
<td>20.80±0.13</td>
<td>22.20±0.53</td>
<td>*</td>
</tr>
<tr>
<td>Heat period (h)</td>
<td>32.70±0.87</td>
<td>38.80±0.49</td>
<td>*</td>
</tr>
</tbody>
</table>

* = significant at P<0.05; NS = No significant at P>0.05; HAI= hours after last injection; h = hour; d = day.

Table 2: Fertility traits of desert do

<table>
<thead>
<tr>
<th>Reproductive traits</th>
<th>Treatment animals</th>
<th>Control animals</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of does</td>
<td>10</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Gestation rate %</td>
<td>100(10/10)</td>
<td>100(5/5)</td>
<td>NS</td>
</tr>
<tr>
<td>Gestation length (day)</td>
<td>149.90±0.35</td>
<td>152.4±1.05</td>
<td>*</td>
</tr>
<tr>
<td>Abortion rate %</td>
<td>0.0</td>
<td>0.0</td>
<td>-</td>
</tr>
<tr>
<td>Kidding rate %</td>
<td>100(10/10)</td>
<td>100(5/5)</td>
<td>NS</td>
</tr>
<tr>
<td>Twins rate</td>
<td>1.1(11/10)</td>
<td>0.0</td>
<td>*</td>
</tr>
<tr>
<td>Fecundity rate %</td>
<td>1.7(17/10)</td>
<td>1.5(5/5)</td>
<td>NS</td>
</tr>
<tr>
<td>Postpartum period (days)</td>
<td>34.80±0.25</td>
<td>73.60±1.12</td>
<td>*</td>
</tr>
</tbody>
</table>

* = significant at P<0.05; NS = No significant at P>0.05.

The gestation length was shorter in treatment group than control group and this related to twins, because the twins have shorter gestation length than single birth and this is in agreement with (Abebe, 1996) and (Akusu, 2000).

The differences in twining rate could occur due to differences in breeds, treatment, and season of the year (Gonzalez et al., 1993). However the postpartum period was shorter in treatment group than control group, this could be due to the effect of breed, season of the year, nutritional level, suckling stimulant, prolificacy and parity of the does (Greyling, 1991; Abebe, 1996; Walkdon, 2001).

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REFERENCES