Synchronization of Nellore Jodipi ewes by different doses of PGF2α


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ABSTRACT
Nellore Jodipi cyclic ewes were synchronized to assess the effectiveness of two different doses of double PGF2α (Cloprostenol sodium) @ either 125 or 250 µg with 9 d interval in Groups I and II based on the estrus response and fertility rate after intra cervical inseminations at 60 and 72 h after 2nd PGF2α. The estrus response (%), onset of estrus (%), duration of estrus (h) and intensity of estrus in ewes synchronized by PGF2α were 80.95 and 85.71; 50.94+3.12 and 48.00+3.40; 24.35+1.41 and 28.22+1.15 and 6.76+0.29 and 6.83+0.34 in Groups I and II, respectively. The conception rate based on 25 d non return rate was 85.71 and 80.95 % with an overall lambing rate of 71.43 and 66.67 % in Group I and II, respectively. The study revealed that the synchronization response among the treated ewes by 125 µg of PGF2α was slightly lesser with higher lambing rate than 250 µg of PGF2α.

Key words: Estrus synchronization, Nellore Jodipi ewes, Prostaglandin F2α.

INTRODUCTION
Estrus synchronization together with Artificial Insemination (AI) in ewes is one of the important tools in the improvement of reproductive efficiencies (Hashemi et al. 2006). Prostaglandin (PGF2α) has long been utilized in the livestock industry as a management tool to induce estrus. The ability of exogenous PGF2α in turn depends on day of administration of drug (day of estrous cycle), dose, frequency of exposure and route of administration (uterine Vs systemic). Therefore present study was undertaken to evaluate the efficacy of different doses of Prostaglandin F2α in synchronizing Nellore Jodipi ewes.

MATERIALS AND METHODS
The present study was undertaken at Livestock Research Station, Palamaner situated at an altitude of 680 meters above mean sea level on 79° longitudes and 13° latitude. The average temperature and humidity recorded were 30° C (19-40) and 40% (21-92), respectively. The experiment was carried out during breeding season i.e., in the month of February, 2015 to study the estrus response and fertility rate in cyclic ewes synchronized by synthetic prostaglandin (Cloprostenol sodium) (Pragma®) (125 and 250 µg). Forty two Nellore Jodipi non-lactating and previously lambed reproductive capable cyclic ewes having good health were selected and divided into two groups i.e., Group I and Group II consisted of 21 ewes each (Fig. 1). All the ewes were synchronized by double Prostaglandin and the estrus response was studied in terms of number of animals that came to estrus, time of onset of estrus, duration of estrus and intensity of estrus. The estrus response of ewes was recorded by using aproned rams at 1:8 ratio between Ram: Ewe for about an hour from 24 to 72 h after 2nd PGF2α with an interval of 6 h i.e., at 6.00, 12.00, 18.00 and 00.00 h (Fig. 2). Estrus intensity of the ewe was measured and graded after addition and quantification of respective scores of the parameters into weak estrus (0-4), intermediate estrus (5-8) and intense estrus (9-12) (Table 1). Care was taken to collect the semen from the selected Rams and the ejaculate with >50 % individual motility was diluted (1:2 to 1:4 ratio) with TCFY diluent so as to maintain optimum concentration of spermatozoa (200 × 10v spermatozoa per dose). All the ewes irrespective of exhibition of estrus symptoms were inseminated at 60 and 72 h after 2nd PGF2α by slowly depositing 0.2 ml of freshly diluted semen into the cervix (Cseh et al. 2012) (Fig. 3). Fertility rate was assessed by 25 d non return rate and by the lambing rate. The data obtained were analysed by using appropriate statistical methods (Snedecor and Cochran 1968).

RESULTS AND DISCUSSION
Estrus response observed by using aproned ram in synchronized ewes by PGF2α was 80.90 (17/21) and 85.71 (18/21) in Groups I and II, respectively. The higher estrus response in ewes (Group II) when compared to ewes (Group I) without significant difference (P≥0.05) between the groups (Table. 2) was in line with the results of Homeida et al. (2009). While the estrus response was higher in the findings of Ashmawy et al. (2014) and lower in the findings of Zohara et al. (2014) and lower in the findings of Ashmawy et al. (2012) compared to the present study.

The present findings supports the hypothesis that the most of ewes were sensitive to 2nd dose of prostaglandin.
(Menchaca et al. 2004) leading to complete luteolysis with the higher dose of PGF2α in Group II and variations observed among different studies might be due to difference in the breed (Karagiannidis et al. 2001), breeding season (Zonturlu et al. 2011), latitude and management (Zonturlu et al. 2008). The higher estrus response in Group II ewes might be due to differences in ovarian status among the ewes at the time of treatment (Ashmawy, 2012) and better luteolysis (Hafez, 2008) during growing phase of largest follicle leading to the synchrony of estrus and the lesser in Group I ewes might be due to poor luteolysis leading to inadequate follicular development (Letelier et al. 2011).

The overall mean interval from the time of administration of second PGF2α injection to the time of first appearance of behavioral estrus in Group I and Group II ewes was 50.94 ± 3.12 and 48.00 ± 3.4 h, respectively with no significant difference between the groups (Table 2). The time of onset of estrus in the present work is akin to the observations of Naqvi et al. (1997). Contrary to present study, Letelier et al. (2011) and Ashmawy et al. (2012) observed lesser values and Zohara et al. (2014) observed longer values. The delay in the onset of estrus in ewes synchronized with the small doses of cloprostenol was might have taken more time to induce complete luteolysis than a larger dose leading to delay in preovulatory LH surge and preovulatory growth (Contreras-Solis et al. 2009).

The mean duration of estrus was 24.35±1.41 and 28.22±1.15 h in Groups I and II, respectively with non-significant difference (P≥0.05) between Groups (Table 2). Similar results were noticed by Zohara et al. (2014) but Homeida et al. (2009) observed lesser duration of estrus than the present study. The variations in the duration of estrus observed might be due to difference in the breed (Karagiannidis et al. 2001), breeding season (Ataman et al. 2006, Zonturlu et al. 2011), latitude and management (Zonturlu et al. 2008) and administration of higher amount of prostaglandin and its effect on the luteolysis. Estrus intensity measured in ewes that were synchronized by PGF2α was 6.77±0.29 and 6.83±0.34 in Groups I and II, respectively (Table 2). Intensity of estrus exhibition noticed in the present study is slightly higher than the findings of Homeida et al. (2009) in Naeimi (6±0.10). The difference in the overall estrus intensity between Groups I and II synchronized ewes was not significant (P≥0.05). The higher intensity observed in the present study might be due to breed and dose variation.

### Table 1: Score card for assessment of intensity of estrus in ewes (Homeida et al., 2009)

<table>
<thead>
<tr>
<th>Parameter observed</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of expression of restlessness</td>
<td>0-3</td>
</tr>
<tr>
<td>Standing to be mounted</td>
<td>0-3</td>
</tr>
<tr>
<td>Vocalization</td>
<td>0-3</td>
</tr>
<tr>
<td>Swelling of vulva and Mucus discharges</td>
<td>0-3</td>
</tr>
</tbody>
</table>

Contreras-Solis et al. 2009.

Fig. 1: Nellore Jodipi Ewe

Fig. 2: Preparation of apronized rams – covering lower abdominal region & painting of brisket

Fig. 3: Artificial Insemination in ewe
In the present study, the number of ewes that did not return to estrus on 25 d post AI (Non return rate) were 85.71 (18/21) and 80.95 % (17/21) in Group I and II, respectively. But the difference was not significant (P ≥ 0.05).

The overall lambing rate was 71.43 and 66.67 % in Group I and II, respectively and the difference was non-significant (P ≥ 0.05). In the present study higher lambing rate in Group I ewes has delayed the onset of estrus but with slightly greater ovulation rates (Contreras-Solis et al. 2009). The smaller dose of prostaglandin might have resulted in to completion of preovulatory growth (Contreras-Solis et al. 2009) leading to enhanced lambing rate. Variations in lambing rate may be attributed to the difference in the time elapsed between PGF2α treatment and the onset of estrus depending on the stage of the estrous cycle at the time of PGF2α treatment (Voh et al. 1987) and the lower lambing rates in Group II ewes might be due to the stage of follicle at the time of estrus or aging of ovum (Hunter and Greve, 1997).

**CONCLUSION**

Nellore Jodipi ewes can be synchronized by double doses of 125 and 250 µg of PGF2α (Cloprostenol sodium) 9 d apart with acceptable estrus response and lambing rate.

**REFERENCES**


