A Comparative study of Estradiol Level by various Estrus synchronization protocols in Kilakarsal ewes during the breeding season

M. Sundara Vinayaki*

*Assistant Professor,
Department of Veterinary Physiology and Biochemistry,
Veterinary College and Research Institute, Tirunelveli-627 358
TAMILNADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY
*Corresponding Author E-mail: mvinayagi@gmail.com
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ABSTRACT
To produce lambs consistently throughout the year in an accelerated lambing system, the use of exogenous hormones can be utilized in order to induce a synchronized estrus and stimulate cyclicity during the anestrous period. This can be achieved by either lengthening or reducing the duration of the estrous cycle by administration of exogenous progesterone (P4) or prostaglandin (PG). Gonadotropin-releasing hormone (GnRH) and Nanao GnRH may also be incorporated into treatment protocols to assist in initiating hormonal events necessary to synchronize estrous cycles, such as estrus and ovulation, especially in anestrous ewes. The objective of this study was to determine the effects of various estrus synchronization protocols utilizing the estrus synchronization protocols for Estradiol Level during reproductive cycle in Kilakarsal ewes at Breeding season. Blood samples were collected via jugular venipuncture on the day of CIDR insertion. On the day of CIDR removal. On the day of estrum. On the day of mating and On the 70th day of pregnancy. Serum was analyzed to estradiol concentration which was estimated by direct immunoenzymatic method using ELISA kit (RIA). From the values recorded on the day of estrum though no significant difference was observed between any of the treatment groups, the control showed the lowest value of estradiol which was significantly (P<0.05) different from that of the other groups.

Keywords: Gonadotropin-releasing hormone (GnRH), Nanao GnRH, Ewes

INTRODUCTION
Sheep are often referred to as “short day” breeders because they begin to cycle and become sexually responsive when the amount of darkness increases in late summer to early autumn (Robinson & Karsch, 1988). Intravaginal CIDRs are utilized on commercial sheep operations as a controlled reproductive management tool. Limited research has been conducted utilizing the CIDR in combination with GnRH and PG in seasonally anestrous and estrous ewes.
Therefore, the following research focuses on synchronizing estrus in ewes during breeding seasons by potentially reducing the days to detected estrus, while increasing overall ewe prolificacy through the utilization of various CIDR protocols that include various combinations of the administration of GnRH and PG. The objective of this study was to evaluate the effects of combinations of controlled internal drug releasing (CIDR) inserts infused with progesterone (P4) in association with prostaglandin (PG), and gonadotropin-releasing hormone (GnRH) and nano conjugated GnRH on the Estradiol Level during reproductive cycle in Kilakarsal ewes at main season.

**MATERIALS AND METHODS**

The study was carried out during breeding season (Jul-Aug in Kilakarsal sheep maintained under semi-intensive system of rearing at Instructional Livestock Farm Complex, Veterinary College and Research Institute and District Livestock Farm, Abishegapatti, Tirunelveli. The experiment was carried out) in a total of 140 cyclic Kilakarsal ewes were selected at random and grouped in to seven. Each group consist of twenty Animals. The first group was kept as control while other six groups were numbered from I to VI and subjected to six different hormonal treatments for estrus synchronization as per the regimen described below.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Without any treatment</td>
</tr>
<tr>
<td>Group - I</td>
<td>CIDR</td>
</tr>
<tr>
<td>Group - II</td>
<td>CIDR with GnRH</td>
</tr>
<tr>
<td>Group - III</td>
<td>CIDR with PGF2α</td>
</tr>
<tr>
<td>Group - IV</td>
<td>CIDR, PGF2α with GnRH</td>
</tr>
<tr>
<td>Group - V</td>
<td>CIDR with Nanoconjugated GnRH</td>
</tr>
<tr>
<td>Group - VI</td>
<td>CIDR, PGF2α with Nanoconjugated GnRH</td>
</tr>
</tbody>
</table>

Blood samples were collected five times through jugular puncture, from all the treatment groups during various stages of the experiment as listed below.

First collection : On the day of CIDR insertion.
Second collection : On the day of CIDR removal.
Third collection : On the day of estrus.
Fourth collection : On the day of mating.
Fifth collection : On the 70th day of pregnancy.

From the samples serum was separated and subjected and estradiol concentration was estimated by direct immunoenzymatic method using ELISA kit obtained from Agappe Diagnostics Limited as described by Tsang et al. (1980).

**RESULT AND DISCUSSION**

Effect of different estrus synchronization on the serum estradiol (ng/mL) during reproductive cycle in Kilakarsal ewes
The mean serum estradiol level of the control and other groups of ewes at different phases of reproductive cycle during main are presented in Table. day of estrum, day of mating and on the 70th day of pregnancy in control and different treatment groups ranged from 4.18±0.06 to 4.29±0.04, 8.15±0.08 to 8.44±0.06, 16.06±0.41 to 18.04±0.13, 14.06±0.20 to 14.34±0.13 and 3.36±0.14 to 3.56±0.09 ng/mL, respectively. From the values recorded on the day of estrum though no significant difference was observed between any of the treatment groups, the control showed the lowest value of estradiol which was significantly (P<0.05) different from that of the other groups.

However the values increased from the day of CIDR insertion to the day of estrum and thereafter tended to decline as observed on the day of mating and 70th day of pregnancy and the variations were statistically significant. While the same trend was observed in all the treatment groups the highest values were on the day of estrum in all the groups and ranged from 16.60±0.41 to 18.04±0.13ng/mL in Kilakarsal ewes.

Romano (2004) and Terqui et al. (1973) reported that the concentrations of 17β estradiol in the plasma increases three days before estrus and attained a maximum on the day of estrus and then declined.

Thomas et al. (1988). Majid and Mazaher. (2017 ) reported that the estradiol level varied from 7-8 pg / mL to a peak of 10-15 pg / mL depending on the stage of estrus cycle during the follicular phase of Merino ewes.

As reported by all the above authors the serum estradiol value was found to be highest in this study on the day of estrum in control and all the treatment groups of Kilalarsal ewes.

It may be inferred that the advocation of CIDR, PGF2α with nanoconjugated GnRH protocol to induce ES had resulted in normal and safe response in the ewes and may be adopted in the field to increase sheep production.

**REFERENCES**


