Effect of Laparoscopic Insemination on Reproductive Performance of Indigenous Çine Çapari Sheep

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ABSTRACT

This study aims to investigate the feasibility of laparoscopic insemination methods in Çine Çapari sheep which is considered a genetic resource and results of the study is to reveal the possibilities of transferring to the field. In the present study, data were collected from Çine Çapari sheep at 2002-2003 and 2008-2009 mating seasons. Nine rams were used for laparoscopic artificial insemination of ewes. Data were evaluated with respect to gestation length, litter size, duration between sponge removal and beginning of estrus activity (DBSR-BOA), duration between beginning of estrus activity and laparoscopic AI (DBSR-LAI) and AI success rate. The least square means for mentioned traits were found as 2003-2004: 1.04, 24.99, 22.31, h and 69.57 for 2003-2004 and 148.70 days, 1.41, 42.18 h, 18.35 h and 63.04 for 2008-2009 lambing periods, respectively. Our results show that laparoscopic insemination will contribute to the conservation activities in Çine Çapari sheep.

INTRODUCTION

The use of AI can greatly increase the number of offspring produced per sire per year because a ram has the potential to produce enough spermatozoa to inseminate thousands of ewes. Laparoscopic techniques allow time-efficient and minimally invasive intracervical insemination of sheep. Frozen semen usually has poorer fertility (less viable sperm) as the chances of conception are lower than if using fresh semen. With frozen semen, more sperm has to be used per ewe (per estrus), and laparoscopic insemination is needed. This makes the process more expensive and less likely to work. As a result, each ram ejaculate has a low number of eew doses. Currently, a pregnancy rate of 60-80% is regarded as a reasonable commercial result using laparoscopic AI.

AIM

This study aims to investigate the feasibility of use of laparoscopic insemination methods in Çine Çapari sheep breed under genetic conservation program.

MATERIAL AND METHODS

ANIMAL & MANAGEMENT

Animal were fed with concentrate mix and had access to a shelter, where water and salt stone complement were available.

SEMIN COLLECTION & PREPARATION

Semen was collected from each ram using an artificial vagina. Evaluated semen characteristics as follow:

**TABLE 1.** Simple statistics for reproductive parameters of laparoscopically inseminated Çine Çapari ewes

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std.</th>
<th>Minimum</th>
<th>Maximum</th>
<th>CV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestation length (day)</td>
<td>43</td>
<td>149.23</td>
<td>2.20</td>
<td>143.00</td>
<td>153.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Litter size</td>
<td>51</td>
<td>1.09</td>
<td>0.60</td>
<td>1.00</td>
<td>3.00</td>
<td>43.30</td>
</tr>
<tr>
<td>DBSR-BOA(h)</td>
<td>67</td>
<td>40.49</td>
<td>9.47</td>
<td>16.16</td>
<td>58.55</td>
<td>23.40</td>
</tr>
<tr>
<td>DBSR-LAI(h)</td>
<td>67</td>
<td>19.59</td>
<td>8.22</td>
<td>3.59</td>
<td>40.44</td>
<td>42.00</td>
</tr>
<tr>
<td>AI success rate</td>
<td>69</td>
<td>65.21</td>
<td>47.98</td>
<td>0.00</td>
<td>100.00</td>
<td>73.60</td>
</tr>
</tbody>
</table>

CV: Coefficient of variation, DBSR-BOA (h): Duration between sponge removal and beginning of estrus activity (h), DBSR-LAI (h): Duration between beginning of estrus activity and laparoscopic AI (h).

**DISCUSSION**

The insemination success obtained as 69.57% and 63.04% in 2003-2004 and 2008-2009 lambing period, respectively, are close to results those reported by Yamak et al. (2003) at 64.00%.

Obtained LAI success rate in this study was lower than the results reported by Evans (1988) and Kihlholzer et al. (1997). Bonev et al. (2002) reported that the AI success rate was 74% with fresh semen.

The mean values of duration between sponge removal and beginning of estrus activity and duration between beginning of estrus activity and laparoscopic artificial insemination were not significant in the present study and in agreement with previous report by Donovan et al. (2001).

The mean values of duration between sponge removal and beginning of estrus activity and duration between beginning of estrus activity and laparoscopic AI were not significant on the AI success. Donovan et al. (2001) reported that the timing of AI did not have any effect on pregnancy rate.

**CONCLUSION**

In conclusion, LAI technique, is an effective method of insemination with fresh or frozen-thawed semen, but cost of application limits its use.

It is important to determine the feasibility of use of LAI technique in genetic conservation programs.

In combination with modern reproductive technologies there is potential to use AI, embryo transfer and stored gametes (genetic resource banks) to support conservation measures for the maintenance of genetic diversity in threatened species.

Our results show that laparoscopic insemination will contribute to the conservation activities in Çine Çapari sheep. Planning the settings and controlling the breeding may be possible with the effective use of this technique.