Himachal Pradesh is a state with 70% of people associated with agriculture and livestock rearing. Marginal farming system is quite financially unviable as the farmer is willing to maintain a cow until she is lactating, but once the cow becomes permanently dry, whole scenario changes and farmers abandon them (Singh et al. 2017).

In western countries, infertile/sterile cows are culled from herd and slaughtered. However, in India where no such provision is made for disposal of these cows, people abandon them when they become uneconomical, which adds to stray cattle population which is escalating manifolds (Kumar 2010). The causes of infertility in abandoned cows are many and can be complex. In order to minimize economic losses, there is need to record the incidence of reproductive problems, their possible etiology with suitable therapeutic measures (Sharma et al. 2018).

Therefore, the present study was carried out with the objectives of clinical evaluation of genitalia, identification of possible etiology of reproductive abnormalities in abandoned cows maintained in different Goshalas of Himachal Pradesh and to develop strategies for rehabilitation and therapeutic management.

Cows kept in various Goshalas in different districts of Himachal Pradesh were selected for study. History of the abandoned animal, if available, was taken from the care takers of the Goshalas which included age, parity, cycle length, feeding status, previous fertility records, date of last calving, post-partum estrus, service dates, natural service or artificial insemination etc. General examination of these cows was done to select cows suffering with reproductive abnormalities and then numbered ear tags were applied to each one for identification. Cows with ailments of reproductive tract were examined thoroughly by rectal examination method and 321 abandoned cows were diagnosed with 402 reproductive ailments (few of them with multiple disorders). Specific treatments of these cows were done as per diagnosis of reproductive ailment.

Cows suffering from endometritis were treated with single intra-uterine (i/u) administration of 500 mg of Cephapirin benzathine (Metricef, Intervet, India) and i/m administration of Enrofloxacin (Fortivir, Virbac, India) at dose rate of 7.5 mg/kg body weight (BW) once only.

Cows diagnosed with cervical disorders, such as cervical fibrosis and kinked cervix were served with natural service by bull or inseminated with double dose of frozen semen through AI. Similarly, the cows affected with suspected salpingitis were treated with parental administration of antibiotics such as Enrofloxacin (Fortivir, Virbac, India) @ 7.5 mg/kg BW.

Cows diagnosed to be true anestrus and small/weak genitalia were administered Toldimphos sodium (T-Phos, Zydus AHL India) @ 5–10 ml i/m and Calcium levulinate (Cal-BD, Vetsfarma Ltd. India) @ 15–20 ml i/m. Tablets CoFeCu (CoFeCu Plus, Indian Herbs India) were also given to each cow @ 2 tablets p.o. daily for 20 days. Vitamin supplementation was provided by injecting Vitamin A, D3, E (Vetade, Zydus AHL India) @ 5 ml i/m or Vitamin A, D3, E and H (Intavita-H, Intas Pharmaceuticals Ltd. India) @ 5 ml i/m to these cows. Cows diagnosed with silent estrus were treated with i/m administration of Cloprostenol sodium (Clostrenol, Zydus AYL India) @ 500 µg i/m.

Cows diagnosed with miscellaneous conditions were treated as per etiology e.g. cows with follicular cyst were treated with i/m administration of Buserelin-acetate (Receptal Vet, Intervet India) @ 20 µg (5 ml) and cows having pyometra were treated with i/m administration of Cloprostenol sodium along with i/m administration of antibiotics (Fortivir, Virbac, India).

In present study, incidence of gynaecological disorders inflicted due to technical errors (cervical disorders, endometritis and ovaro-bursal adhesions) were quite high (50.00%) whereas, success in treating such cows was quite low (12.75%). Comparatively, out of lesser number of cows (38.80%) affected by poor management (true anestrus and silent estrus) more cows (44.45%) could be treated.
Table 1. Incidence and post-treatment follow-up of reproductive problems maintained in various Goshalas of Himachal Pradesh

<table>
<thead>
<tr>
<th>Type of cause</th>
<th>Gynaeco-clinical diagnosis</th>
<th>Incidence (%)</th>
<th>Treated (n)</th>
<th>Followed (n)</th>
<th>Responded (n)</th>
<th>Conceived (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical errors</td>
<td>Endometritis</td>
<td>27.86</td>
<td>112</td>
<td>83</td>
<td>18</td>
<td>21.69</td>
</tr>
<tr>
<td></td>
<td>Cervical disorders</td>
<td>14.43</td>
<td>58</td>
<td>46</td>
<td>1</td>
<td>2.17</td>
</tr>
<tr>
<td></td>
<td>Affections of fallopian tubes</td>
<td>7.71</td>
<td>31</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50.00</td>
<td>201</td>
<td>149</td>
<td>19</td>
<td>12.75</td>
</tr>
<tr>
<td>Poor management</td>
<td>True anestrus/weak genitalia</td>
<td>33.83</td>
<td>136</td>
<td>83</td>
<td>35</td>
<td>42.17</td>
</tr>
<tr>
<td></td>
<td>Silent estrus</td>
<td>4.97</td>
<td>20</td>
<td>16</td>
<td>9</td>
<td>56.25</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>38.80</td>
<td>156</td>
<td>99</td>
<td>44</td>
<td>44.45</td>
</tr>
<tr>
<td>Miscellaneous reproductive disorders</td>
<td>Overall</td>
<td>11.20</td>
<td>45</td>
<td>32</td>
<td>1</td>
<td>3.13</td>
</tr>
</tbody>
</table>

By examining the reproductive status of abandoned cows kept in 18 goshalas of Himachal Pradesh. Overall 321 abandoned cows were diagnosed with 402 reproductive ailments (few of them with multifactor etiology). Amongst the genital tract ailments in abandoned cows, a very high incidence, i.e. 50%, of reproductive disorders was associated with injuries/technical errors (endometritis, cervical disorders, affections of fallopian tubes and adnexa) of which only 12.75% were treatable. However, 38.80% incidence of managemental/miscellaneous reproductive ailments responded to treatment. In conclusion, treatment of abandoned cows with respect to specific diagnosis led to conception in fair number of cows. Abandoning of cows by the farmers is increasing day by day which further adds to the stray cattle population. Although nutritional management plays an important role in maintaining the fertility of cows, but proper diagnosis and therapeutic mangement of the malady in infertile cows is need of the hour to avoid abandoning and make farmers enjoy the benefits of rearing healthy cows.

**SUMMARY**

The present study was carried out with an objective of examining the reproductive status of abandoned cows kept in 18 goshalas of Himachal Pradesh. Overall 321 abandoned cows were diagnosed with 402 reproductive ailments (few of them with multifactor etiology). Amongst the genital tract ailments in abandoned cows, a very high incidence, i.e. 50%, of reproductive disorders was associated with injuries/technical errors (endometritis, cervical disorders, affections of fallopian tubes and adnexa) of which only 12.75% were treatable. However, 38.80% incidence of managemental/miscellaneous reproductive problems (true anestrus and silent estrus) was found and a higher post treatment recovery rate was recorded. This can be attributed to the faulty AI technique, inefficient inseminators or inadequate training on AI. Overall, 22.86%
abandoned cows having various reproductive ailments conceived following different therapeutic regimes.

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