STUDIES ON REPEAT BREEDING OF BUFFALOES

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ABSTRACT

The present study was carried out in outdoor clinics of the Veterinary College and private farms in and around Patna, Bihar, India. After gynecological examination 18 buffaloes from clinics as well as private farms were selected as true repeat breeders. The buffaloes were examined for ectoparasites, and animals having parasitic infestation were treated accordingly with albendazole 10 mg/Kg body wt. Mineral mixture was given to all the animals at the dose rate of 30 gm/animal/day to rule out any marginal nutritional deficiencies. Animals having short or irregular estrus cycle, purulent or mucopurulent discharge, or having ovulatory disturbance were excluded from the present study. Cervical mucous samples were collected by taking all possible sterile precautions. The colour and consistency of cervical mucous was studied in respect of its cleanliness and transparency. The animals harboring turbid, translucent, opaque cervical mucous or cervical mucous with flakes or pus were excluded from the present study. The consistency of cervical mucous was studied in respect of thin and thick. The pH of cervical mucous was studied immediately after collection of sample with the help of narrow range pH paper (range 6.5 to 9.00) having the difference of 0.5 only. The incidence of repeat breeding in buffalo was found 8.82%. Highest incidence of repeat breeding was observed in second parity (27.77%) and lowest incidence was observed in 4th and onward partum (11.11%). The mean pH ± S.E. of cervical mucous of repeat breeder buffaloes was found to be 8.027 ± 0.110 with the coefficient of variation of 5.84%. The consistency of cervical mucous of repeat breeder buffaloes was found to be thin in 55.55% and thick in 44.44%. The conception rate found was 62.50% and 50.00% respectively for thin and thick consistency of cervical mucous.

INTRODUCTION

The buffalo plays an important role in maintaining a sustainable food production system in the developing countries (Nanda and Nakao, 2003). The success of the dairy farm lies in ensuring proper and optimal reproductive rhythm of each individual female in the herd within the normal physiological limits. Any deviation in breeding rhythm results in progressive economic losses due to widening of the dry period, the calving interval as well as lactation during the life time of the animals. Infertile buffaloes mean a loss in milk production whereas fewer calves reduce the efficacy of selection in dairy herd improvement. Efficient dairying and breeding demand that an

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animal shall give birth to a healthy calf every twelve months and be in milk for at least 300 days in lactation. Effort should therefore be made to enhance fertility in dairy animals by narrowing down their dry period to the barest minimum range of 60 to 90 days. Thus, fertility of milch animals appears to play a major role in dairy economics. The productivity of buffaloes, however, remains low largely due to poor management of health, nutrition (Bal Krishnan and Bakagopal, 1994) and breeding (Rane et al., 2003).

One of the most important and commonly encountered sub fertile conditions in buffalo which plays a vital role in dairy economics is repeat breeding. The repeat breeding syndrome is defined as a condition in which dairy animal have a regular estrus cycle and appear normal on superficial clinical examination but fail to become pregnant following three or more breedings (Bartlett et al., 1986). The condition may occur due to defects in gametes, failure of gametic encounters, endocrine dysfunction, infection, nutritional defects etc., which ultimately leads to either fertilization failure or early embryonic death. Earlier works indicated 39.7% conception failure due to non fertilization and 39.2% due to early embryonic mortality (Tanabe and Casida, 1949). The incidence of the repeat breeding condition in buffaloes varies depends upon the mangemental condition of the farm.

The productivity of buffaloes remains low largely due to poor management of health, nutrition (Bal Krishnan and Bakagopal, 1994) and breeding (Rane et al., 2003). Anestrus due to ovarian dysfunction and silent ovulation and repeat breeding are two major reproductive disorders in buffaloes (Goley and Kadu, 1995). A high incidence of infertility and repeat breeding in buffaloes mainly of infectious nature has been reported by several workers (Malik et al., 1987). Exploration of possible causes and measures for restoring fertility in repeat breeding animals has been the objective of reproductive biologists since the beginning. In spite of good progress made, the causes of conception failure are largely not well understood and repeat breeding remains the biggest problems of the dairy industry.

Therefore, the present investigation was carried out to see the rate of repeat breeding in buffaloes, physical characteristics of cervical mucous and conception rate after treatment of repeat breeder buffaloes.

**MATERIALS AND METHODS**

The present study was carried out in outdoor clinics of the Veterinary College and private farms in and around Patna, Bihar, India. A total of 68 buffaloes were brought to the clinics and out of which six were found to be repeat breeders. After gynecological examination, 18 buffaloes from clinics as well as private farms were selected as true repeat breeders, i.e. animals that had regular estrus cycle and periods but had failed to become pregnant following three or more breedings with fertile semen. Gynecological examination of such animal did not reveal any gross abnormalities of the genital organs. The buffaloes were examined for ectoparasites and animals having parasitic infestation were treated accordingly with albendazole 10 mg/Kg body wt. Mineral mixture were given to all the animals at the dose rate of 30 gm/animal/day to rule out any marginal nutritional deficiencies. Animals having short or irregular estrus cycles, purulent or mucopurulent discharges or having ovulatry disturbances were excluded from the present study.
Collection of cervical mucous

Cervical mucous sample were collected taking all possible sterile precautions. The vulvar and perineum region were cleaned and dried. The vulvar lips were spread by an assistant and a sterilized insemination gun along with an assembled factory sterilized sheath were passed through the vagina. Rectally, the cervix and insemination gun was manipulated until the tip of the sheath was introduced into os - cervix. Then the insemination gun was withdrawn leaving the sheath in the cervix and cervical mucous was aspirated (Dabas and Maurya 1988). Aspirated mucous was then transferred to a sterilized test tube to study the physical characteristics, viz. colour, consistency and hydrogen ion concentrations.

Examination of physical characteristics of cervical mucous:

The colour and consistency of cervical mucous was studied in respect of its cleanliness and transparency since only those animals which had clean and transparent cervical mucous were selected. The animals harboring turbid, translucent, opaque cervical mucous or cervical mucous with flakes or pus were excluded from the present study. The consistency of cervical mucous was studied in terms of thin and thick (Sukhdeo and Rao 1971). Thin cervical mucous flowed easily on a glass slide kept inclined at a 45 degree angle.

Examination of pH of cervical mucous:

Hydrogen ion concentration (pH) of cervical mucous was studied immediately after collection of the sample with the help of narrow range pH paper (range 6.5 to 9.00) having the difference of 0.5 only.

Treatment of repeat breeding animals and insemination

All the 18 animals which were marked as repeat breeder were investigated for cervical mucous consistency and pH. Treatment of the animals was done with various antibiotics, and 12 animals were investigated and inseminated after treatment.

Conception rate

Between 45 and 60 days after insemination, the animals were checked for pregnancy by per rectal examination to know the efficacy of each treatment.

Statistical analysis:

Standard statistical procedure was applied to test the various parameters (Snedecor and Cochran, 1968).

RESULTS

Incidence of repeat breeding

The incidence of repeat breeding is presented in Table 1. A total of 68 buffaloes were examined in the clinics of The Veterinary College, Patna, out of which six were found to be repeat breeder. Therefore, the percentage of repeat breeding was 8.82 Incidence of repeat breeding of 18 repeat breeding buffaloes, selected from private farms as well as college clinics were analyzed parity - wise (Table 1).

Physical characteristic of cervical mucous:

Different scores of physical characteristics of cervical mucous, viz. colour, consistency and hydrogen ion concentration (pH), were examined. The results of physical characteristics (colour and
consistency) of cervical mucous of repeat breeder buffaloes in relation to conception rate has been presented in Table 2.

It is evident from Table 2 that the colour of cervical mucous was clean and transparent in all 18 buffaloes selected for present study. Out of 18 animals, 12 animals were investigated and inseminated till 2nd heat after treatment. A total conception rate of 58.33% was obtained as revealed in Table 2. The consistency of cervical mucous of repeat breeder buffaloes was found to be thin in 55.55% and thick in 44.44% of the animals before treatment. Whereas thin consistency was found in 66.66% and thick in 33.33% animals after treatment. The conception rate found was 62.50% and 50.00%, respectively, for thin and thick consistency of cervical mucous. The percentage of conception was higher among buffaloes having thin consistency of cervical mucous than those having thick consistency (Table 2).

The pH of cervical mucous of all the selected repeat breeder buffaloes was taken prior to treatment. Similarly, the same was recorded after treatment and analysis of variance of pH before and after treatment were calculated. The result obtained has been depicted in Table 3.

Analysis of variance of pH of cervical mucous was done which indicated that pH before and pH after treatment were statistically significant (p < 0.01). The mean pH ± S.E. and CV percent of the cervical mucous were also calculated before and after treatment. The result obtained has been presented in table 3.

The mean pH ± S.E. of cervical mucous of repeat breeder buffaloes before treatment was found to be 8.027 ± 0.110 with the coefficient of variation of 5.84% whereas after treatment the mean pH ± S.E. and coefficient of variation obtained was 7.458 ± 0.114 and 5.32%, respectively as depicted in Table 3.

DISCUSSION

In the present investigation, out of 68 buffaloes brought to the clinics of Veterinary College, Patna six buffaloes were found positive for repeat breeding. Therefore, the incidence of repeat breeding was 8.82%. The present findings were in agreement with the findings of Hussain (1987) who reported an incidence of 8.06% in buffaloes. However, the results differs with the findings of Pandit et al. (1982); Rahumathulla et al. (1986); Samad et al. (1984) who reported comparatively higher incidences of repeat breeding between 12 to 56.44%. While Tomar and Tripathy (1986) reported slightly lower incidence (5%). The variation in the result of different workers might be due to differences in breed, climate, nutrition and management.

The present study revealed that maximum incidence of repeat breeding was observed during 2nd parity (27.77%) and minimum during 4th and onward parity (11.11%), which was in accordance with Hafez, (1987). Maximum incidence of repeat breeding in 2nd parity might be due to maximum milk production during this period, which causes lactational stress and hormonal imbalance. In contrast to these findings, Sah and Nakao (2006) reported maximum incidence (60%) of repeat breeding in heifers.

The colour of cervical mucous was clean and transparent in all the animals selected for the present study. After treatment, 12 buffaloes were inseminated, and overall 88.33% pregnancy was achieved. These findings were in agreement with Sukhdev and Roy (1971) who found that normally the estrus secretions of repeat breeder were clean, but differed from the findings of Mehta (1986),
Table 1. Incidence of repeat breeding in buffaloes in relation to parity.

<table>
<thead>
<tr>
<th>Parity wise distribution of buffaloes</th>
<th>Parity wise break up of figure</th>
<th>Parity wise percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heifer</td>
<td>4</td>
<td>22.22</td>
</tr>
<tr>
<td>Buffalo of 1st parity</td>
<td>3</td>
<td>16.66</td>
</tr>
<tr>
<td>Buffalo of 2nd parity</td>
<td>5</td>
<td>27.77</td>
</tr>
<tr>
<td>Buffalo of 3rd parity</td>
<td>4</td>
<td>22.22</td>
</tr>
<tr>
<td>Buffalo of 4th and above parity</td>
<td>2</td>
<td>11.11</td>
</tr>
</tbody>
</table>

Table 1 indicated that highest incidence of repeat breeding was observed in second parity (27.77%) and lowest incidence was observed in 4th and onward parity (11.11%).

Table 2. Influence of thin or thick consistency of cervical mucous on conception.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Number of clean and transparent sample taken</th>
<th>Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Thin</td>
</tr>
<tr>
<td>No of animal investigated before treatment</td>
<td>18</td>
<td>10 (55.55)</td>
</tr>
<tr>
<td>No of animal investigated after treatment</td>
<td>12</td>
<td>8 (66.66)</td>
</tr>
<tr>
<td>Conception occurred</td>
<td>7 (58.33)</td>
<td>5 (62.50)</td>
</tr>
</tbody>
</table>

Figure in the parentheses indicates corresponding percentage values.

Table 3. Calculation of mean pH ± S.E. and CV percent of repeat breeder buffaloes before and after treatment.

<table>
<thead>
<tr>
<th>Observation</th>
<th>No. of buffaloes</th>
<th>Mean pH ± S.E.</th>
<th>CV%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before treatment</td>
<td>18</td>
<td>8.027±0.110</td>
<td>5.84</td>
</tr>
<tr>
<td>After treatment</td>
<td>12</td>
<td>7.458±0.114</td>
<td>5.32</td>
</tr>
</tbody>
</table>

ab Mean with different superscript differ significantly (p < 0.01).
who reported that only 54.17% of repeat breeder animals had clean and transparent cervical mucous and of Vadodria and Prabhu (1990) who reported 46.67% conception in repeater cattle showing clear cervical mucous.

The consistency of cervical of mucous of repeat breeder buffaloes was found to be thin in 55.55% and thick in 44.44% before treatment, whereas it was thick in 66.66 and thin in 33.33% after treatment. The conception rate was found to be 62.50 and 50%, respectively for thin and thick consistency of cervical mucous. The result revealed that a higher conception rate was found in animals showing thin consistency of cervical mucous than a thick consistency of cervical mucous. This was found to be in agreement with Sukhdev and Roy (1971); Vadodria and Prabhu (1990), whose findings were more or less similar. One cause of Low conception rate in thick cervical mucous could be that muco - proteins are interwined and thus resist the penetration and progressive movement of spermatozoa (Odebald, 1968). Gebhard and Schumacher (1970) also reported that profuse watery and clear cervical mucous was favourable for sperm penetration and that thick scanty and opaque cervical mucous was unfavourable for sperm penetration. However, these findings differ from the finding of Dhaliwal and Sharma (1988) who reported that the animals showing thick cervical mucous had a significantly higher conception rate than those with thin cervical mucous.

The overall mean pH of cervical mucous prior to and after treatment was 8.027 ± 0.11 and 7.458 ± 0.11, respectively. Analysis of variance of mean pH of cervical mucous showed a significant difference before and after treatment. The result revealed that the mean pH of cervical mucous of repeat breeder animals prior to treatment was higher pH than after treatment. The present findings supported Salphale et al. (1993) who reported that the cervical mucous of repeater animals had higher mean pH than that of normal animals. In the present study, most of cervical mucous sample were found more alkaline in reaction in repeater animal prior to treatment than after treatment, and this might have been the cause of conception failure. One reason for this might be infectious organism present in genital tract of repeat breeder animals which cause inflammation and denudation of uterine mucosa. In addition, metabolites of bacteria and inflammatory exudates might have altered the pH of uterine and cervical fluid to the alkaline side resulting in failure of conception due to death of spermatozoa (Raghaban et al., 1971). However, there was general consensus that pH above neutrality provides the most favourable condition for survival and oxidative metabolism of spermatozoa (Mann, 1964). Besides this breed, nutritional variation and electrolyte fluctuation especially Na and K contained in cervical mucous might also be the cause of pH variation (Bocic, 1962).

REFERENCES


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