

## **RACING STRESS AND CONCEPTION RATE IN REPEAT BREEDING BUFFALOES AND COWS**

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### **ABSTRACT**

In this study 215 buffaloes and 180 cows with the history of repeat breeding and prolonged oestrus period (>24 hours) were used. All of the animals had repeated at least twice. A total of 95 animals (50 buffaloes and 45 cows) were inseminated once, 12-18 hours after the start of oestrus and were kept as control, while 165 buffaloes and 135 cows were divided into two treatment groups. In group I, 70 buffaloes and 55 cows were inseminated twice, first at 12-18 hours after the start of oestrus and then 12-24 hours later. In group II, 95 buffaloes and 80 cows were inseminated once at 12-18 hours after the start of oestrus. These animals were then subjected to forced racing for at least 30 minutes. In control group, 18 buffaloes (36%) and 15 cows (33.33%) were found to be pregnant 60 days after insemination. In treatment group I, 36 buffaloes (51.43%) and 30 cows (54.55%), whereas in group II, 70 buffaloes (73.68%) and 58 cows (72.50%), were observed to be pregnant. These results indicate that forced racing may be a good practical and economical tool to improve conception rate in repeat breeder animals where the problem is due to delayed ovulation.

**Key words:** Stress, conception rate, repeat breeding, buffaloes, cows.

### **INTRODUCTION**

Oestrus is the period of acceptance of the male. The oestrus animal usually seeks out the male and stands to be mounted when approached by a male. Normal duration of oestrus in the buffalo is usually less than 24 hours (Ahmad, 2001) and is 18–19 hours in the cow (Levasseur and Thibault, 1987). Spontaneous ovulation usually occurs about 10–12 hours after the end of oestrus in the cow and 15-18 hours in the buffalo. However, prolonged oestrus due to delayed ovulation or ovulation failure has been said to occur and is one of the causes of repeat breeding. Various strategies like rebreeding 24 hours after the first service (VanRensburg and deVos, 1962) and injection of luteinizing hormone (LH) have been tried to increase the conception rate in such animals.

There are controversial reports in the literature regarding the effect of stress factors including transportation, heat, excitation and exercise on induction of ovulation (Baucus *et al.*, 1990; Dalin *et al.*, 1993; Wilson *et al.*, 1998; Hansen *et al.*, 2001). The present study was under taken to observe whether the stress due to forced racing induces ovulation and increases conception rate in the repeat breeding buffaloes and cows.

### **MATERIALS AND METHODS**

Two hundred and fifty buffaloes and 195 cows with a history of prolonged oestrus duration (> 24 hours) and repeat breeding were selected for this study over a period of five years (1993-1998). All the selected animals were rectally examined to note the clinical status of the reproductive organs. Animals showing signs of true heat without any palpable clinical abnormality and had been served at least twice but failed to conceive were included in the study. Selected animals were divided into following groups:

Control group: 65 buffaloes and 50 cows,

Treatment group I: 80 buffaloes and 60 cows,

Treatment group II: 105 buffaloes and 85 cows.

Animals in control group were inseminated once, 12-18 hours after the start of oestrus. In treatment group I animals were inseminated twice, first at 12–18 hours after the start of oestrus and then 12- 24 hours later. Animals in the treatment group II were inseminated only once at 12–18 hours after the start of oestrus and were then subjected to forced racing for at least 30 minutes.

Animals were examined for pregnancy in each group about 60 days after insemination. Out of 250 buffaloes and 195 cows, 215 and 180 animals respectively could be traced. The remaining untraceable

animals were excluded from the analysis. Conception rates (%) in animals of three groups were computed. The data were subjected to two by two relative frequency Chi square test (Samuels, 1991) to find the magnitude of variation in conception rates among animals of the three groups.

## RESULTS AND DISCUSSION

The conception rates in three groups are given in the Table 1. These results indicate significant differences in conception rates among animals of the three groups. The poorest results were recorded in the control group for both species, while the best results were noted in the animals of treatment group II subjected to forced racing.

Low pregnancy rate observed in the control group might have been due to delayed ovulation which took place at the time when the sperms were aged and this resulted either in fertilization failure or early embryonic death. Jainudeen and Hafez (1987) have reported that aging of spermatozoa in the female tract is accompanied by a gradual decrease in their fertilizing capacity, resulting in fertilization failure or embryonic death.

In the treatment group I, where insemination was done twice, 36 out of 70 buffaloes (51.43%) and 30 out of 55 cows (54.55%) conceived. A significant ( $P < 0.05$ ) increase of 15.43 and 21.22% in conception rate of buffaloes and cows, respectively, was found in the treatment group I than the control. This clearly indicates that the double insemination during the same oestrus significantly increases the conception rate. These results are supported by those of Verma and Mohan (1982), who reported that double insemination at 24 hours interval increased the conception rate from 47.61 to 63.63%. The results of the present study are also favoured by the findings of VanRensburg and deVos (1962), who recommended that if ovulation had not occurred by 24 hours after service, the cow should be reinseminated. In this way fresh viable sperm cells would be available at the time of ovulation.

In treatment group II, 73.68 and 72.50% conception rates were observed in buffaloes and cows respectively, which were significantly higher than the

control and the treatment group I ( $P < 0.05$ ). Higher pregnancy rates observed in the treatment group II support the idea that stress due to forced racing can induce ovulation. Mental or physical stress can excite the sympathetic nervous system to provide extra activation of the body (sympathetic alarm reaction) due to release of norepinephrine (Guyton and Hall, 1996). Since LH-RH release is under the control of catecholaminergic neurotransmitters, norepinephrine acts as a stimulatory agent for the release of LH-RH, whereas Dopamine inhibits LH-RH secretion (Hafez, 1987).

It may be concluded from the present study that to improve the pregnancy rate in delayed ovulators, racing stress could be employed to induce ovulation which is economical as well as harmless. It is suggested that for better understanding of the mechanism(s) involved, monitoring of ovaries through ultrasound together with hormonal profile especially LH, should be investigated after induction of racing stress.

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**Table 1: Conception rates in buffaloes and cows of the three groups**

Groups	No. of buffaloes		No. of cows	
	Tested	Pregnant	Tested	Pregnant
Control	50	18 (36.00%) <sup>a</sup>	45	15 (33.33%) <sup>a</sup>
Treatment Group I	70	36(51.43%) <sup>b</sup>	55	30 (54.55%) <sup>b</sup>
Treatment Group II	95	70 (73.68%) <sup>c</sup>	80	58 (72.50%) <sup>c</sup>

Values with different superscripts in a column differ significantly ( $P < 0.05$ ).

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