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Short Communication

# Influence of GnRH treatment on service period in buffaloes

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## ABSTRACT

Studies were conducted on 50 post-partum Mehsani buffaloes. Twenty nine buffaloes received 5.0 ml Receptal (Buserelin acetate 0.0042 mg/ml) i.m. on day 20, post-partum (Gr. I), 14 buffaloes received the same dose of Receptal on day 45 post-partum(Gr. II) and 7 animals served as untreated control (Gr. III). Eleven and 3 animals responded to the GnRH treatment in Gr. I and II, respectively, and 8 and 2 animals in the respective groups conceived with an average service period of 43 and 55 days. Five out of 7 animals conceived by day 82 post-partum in the control group. The service period (82 days) in the control group was considerably higher as compared to both the treatment groups. In the second experiment, 20 post-partum buffaloes were treated with 5 ml. Receptal on day 35 post-partum. Further, these animals received 5 ml Iliren ($PGF_2\alpha$) on day 45 post- partum and a second dose of 5.0 ml. Receptal on the day of estrus and were inseminated with good quality semen. Only two out of ten control animals became pregnant to first service with a service period of 53 days. In the treatment group 12 animals responded to estrus, of which 9 became pregnant (based on progesterone assay on day 21 post breeding). However, subsequently, on clinical examination at day 60 post-breeding, only 6 animals were found to be pregnant and the remaining 3 animals had early embryonic mortality between day 21 and day 60 post-breeding. The service period in the treated animals was 50 days. Serum estradiol and progesterone levels were useful in the detection of pregnant, non-pregnant and early embryonic mortality cases.

**Key words:** GnRH treatment, inter-calving period, buffaloes

Dairy cows must conceive within 90 to 100 days after calving in order to maximize milk and calf production. Prolonged inter-calving period increases the duration of dry period in cows and buffaloes. Hence, this is one of the major points of intervention for the profitable dairy industry. Use of prostaglandin to control uterine infection (Wichtel, 1991) and the use of GnRH to induce early post-partum ovarian activity (Oxender, 1991) has been successful in post-partum cows. However, similar information in buffaloes is scanty. The present study reports the results on the use of GnRH in post-partum buffaloes to control the inter-calving period.

The experiments were carried out at the Livestock Research Station, Gujarat Agricultural University, Sardar Krushi Nagar. In the first experiment, 29 post-partum Mehsani buffaloes were injected 5.0 ml. Receptal (Busereline acetate 0.042 mg/ml.) i.m. on day 20 post-partum (Group I), 14 received same dose of Receptal on day 45 post-partum (Group II) and seven animals served as untreated controls (Group III). Blood samples in the first group were collected on days 20, 30, 40, 50 & 60 post-partum, second group on days 45, 60, 75 & 90 post-partum and for the third group on days 20, 35, 50, 65, 80 & 95 post-partum.

In the second experiment 20 post-partum buffaloes were treated with 5 ml. Receptal on day 35 post-partum. Further, these animals were treated with Iliren ($PGF_2\alpha$) 5 ml on day 45 post-partum and a second dose of 5.0 ml. Receptal on the day of estrus. Blood samples were collected on days 35 and 45 post-partum, day of estrus and days 15, 30, 45 and 60 post-estrus in the treatment group. In the control animals, blood samples were collected from 35 days post-partum to 115 days post-partum at 15 days interval. Serum was separated and stored at –20°C till analyzed. Progesterone and

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**Table 1.** Effect of GnRH treatment on the post partum reproductive performance in Mehsani buffaloes.

| Parameter | Control (n=7) | GnRH treatment | |
|---|---|---|---|
| | | day 20 p.p. (n=29) | day 45 p.p. (n=14) |
| Animals exhibiting estrus | 2 (28.5%) | 11 (38.0%) | 3 (21.0%) |
| GnRH treatment to estrus (days) | --- | 17 | 10 |
| Pregnancies (%) | 2 (28.5) | 8 (27.5) | 2 (14.2) |
| Service period (days) | 82 | 43 | 55 |

estradiol were estimated by standard RIA technique of Kubasaki *et al.* (1984) and Robertson *et al.* (1979), respectively using RIA kits (DPC, USA). The animals were bred at estrus and pregnancy was diagnosed on day 60 post partum by per-rectal examination.

The results of the first experiment revealed that 11 & 3 animals responded to the GnRH treatment in group I & II respectively, 8 and 2 animals respectively, conceived with an average service period of 43 & 55 days as compared to 82 days in control (Table 1). Backett and Lean (1997) also showed that the GnRH treatment significantly reduced the number of open days by 2.75 and services per conception by 0.05. The results of this experiment thus suggest that the GnRH treatment can reduce the service period in post-partum buffaloes, but the percent response is low.

The results of second experiment revealed that only two out of ten control animals became pregnant to first service with the service period of 53 days. In the treatment group 12 animals responded to estrus, of which 9 became pregnant (progesterone assay on day 21 post-breeding). However, subsequently on clinical examination at day 60 post-breeding, only 6 animals were found to be pregnant, whereas, the remaining 3 animals had early embryonic mortality between day 21 and day 60 post breeding. The service period in the treated animals was 50 days (Table 2). Zdunczyk *et al.* (1992) reported that GnRH treatment between day 10 & 12 post-partum results in earlier onset of ovarian function (19.3 Vs 28.5 days respectively in treatment & control group). Further, GnRH and $PGF_2\alpha$ treatment resulted in shorter service period (Caggioni & Campiotti, 1992; Mawhinney & Biggadike, 1998 and Momilovic *et al.*, 1998).

The estradiol levels showed a peak (17 pg/ml) on the day of estrus, and subsequently fell to 5 pg/ml., then reached a basal level of about 10 pg/ml. Singh & Madan (1998) also reported that the plasma estradiol concentration elevated on days 5 to 18 post estrus in GnRH treated animals. They further reported that a sharp and significant decline in plasma estradiol concentration within 24 hrs. is associated with GnRH treatment (Singh & Madan, 2000). Progesterone, on the other hand, had low initial value (0.25 ng/ml) on the day of estrus, which continued to rise subsequently, in pregnant animals till reached about 2 to 2.5 ng/ml. between day 15 and day 30 post breeding, and then maintained a plateau till day 60 post estrus.

The results of these studies led us to conclude that the conception rate at first service in the buffaloes could be increased to 50 % without compromising the service period of 50 to 53 days. However, 8 out of 20 experimental animals did not respond to estrus to the GnRH - PG treatment on day 35 post-partum. Further studies would be needed to target the un-responded animals so that in addition to acceptable conception rate (50 %) amongst the responded animals and service period of 50 to 53 days, further improvement could be made to increase the estrus response beyond 60%. This is

**Table 2.** Response of post-partum Mehsani buffaloes to GnRH and PG treatment.

| Group | Animals exhibiting estrus. n (%) | Pregnant at D.21 post breeding (Progesterone assay) n (%) | Pregnant at D.60 post-breeding (clinical) n (%) | Service period (days) | Services per conception |
|---|---|---|---|---|---|
| Control (n=10) | 2 (20) | 2 (20) | 2 (20) | 53 | 1 |
| Experimental (n=20) | 12 (60) | 9 (75) | 6 (50) | 50 | 1 |

expected to further improve the overall conception rate and breeding efficiency in post -partum buffaloes.

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