

## STRATEGIES FOR IMPROVING REPRODUCTIVE EFFICIENCY OF POSTPARTUM ANESTRUS SURTI BUFFALOES

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ABSTRACT

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The study was conducted at three village co-operative societies of Panchmahal district in Gujarat during the months of January to June, 2011. The postpartum anestrus buffaloes (n=52) were dewormed using Fenbendazole 3 g and then were randomly divided into four groups, viz., Gr-A) Supplementation of Chelated mineral mixture, orally @ 30 g/day/animal for one month (n=14), Gr-B) Inj. inorganic phosphorus and Inj. vitamin AD<sub>3</sub>E 10 ml each, i/m (n=14) at weekly interval for three consecutive weeks, Gr-C) Inj. GnRH (Receptal) 5.0 ml, i/m once (n=12), and Gr-D) untreated control (n=12). The highest conception rate (80.00 %), shortest service period (123.60 ± 2.69 days) and highest reproductive efficiency (66.66 %) was observed for group-C buffaloes follow by group B, A and control group, The corresponding values for group-B were 71.42 per cent, 128.71 ± 1.93 days and 35.71 per cent, and for group-A 66.66 per cent, 137.83 ± 2.63 days and 28.56 per cent respectively. Injection of Receptal had beneficial effect on reproductive performance with improved conception rate and reduced service period as compared to other treatments and control group of anoestrus buffaloes.

Key words: Postpartum anestrus buffaloes, Estrus induction response, Conception rate.

Postpartum fertility is one of the major factors of economic importance in buffalo reproduction. Because of diversity in feeding and management practice, large number of animals exhibit long postpartum anestrus under field condition. Prolonged postpartum anestrus is the major reproductive concern of economic losses to the buffalo breeder. It was reported that gonadotrophin releasing hormone (GnRH) treatment has a good therapeutic action to enhance early resumption of ovarian activity in sucker buffalo-cows (Shah *et al.*, 2002). Early establishment of cyclic ovarian activity in postpartum buffaloes is desirable as it improves the reproductive efficiency. The majority of cows and buffaloes resume ovarian cycles within the first month of calving (Shah, 1999; Patel *et al.*, 2005). Some animals have a longer postpartum interval and may still be acyclic during the period when they should be inseminated (Lamming and Bulman, 1976; Khasatiya *et al.*, 2006). Failure to resume ovarian activity after

calving is the main reason for delay in conception (Abdoul-Ela *et al.*, 1988). Early postpartum breeding to shorten the calving interval in buffaloes would increase reproductive efficiency (Shah *et al.*, 2002; Khasatiya *et al.*, 2006). The aim of of this study was to evaluate of different therapeutic strategies for improving reproductive efficiency of postpartum anestrus Surti buffaloes under field conditions.

The present research work was carried out under field conditions on 52 more than 90 days postpartum anestrus Surti buffaloes. The selected buffaloes were dewormed using Fenbendazole 3 g and then were divided into four groups. Animals of group-A (n=14) received oral supplementation of chelated mineral mixture @ 30 g/day/animal for 30 days (Manufactured by Panchamrut Dairy, Godhara). Group-B buffaloes (n=14) were treated with intramuscular injection of Tonophosphan (Sodium salt of 4-dimethylamino-2-methylphenyl phosphoric acid 0.2g/ml, Intervet) and

Vitacept (Vitamin AD<sub>3</sub>E, Concept Pharmaceuticals) each 10 ml per animal thrice at weekly interval. Group-C buffaloes (n=12) were treated with single injection of Receptal, 5 ml, i/m (Buserelin acetate 0.0042 equivalent to 0.004 mg/ml, Intervet International GmbH, Germany) and Group-D (n=12) buffaloes served as untreated control. All the treated and control buffaloes were monitored for two to three months from 90<sup>th</sup> day onward postpartum. They were monitored for estrus detection and were bred by AI, if found in standing oestrus. The non-returned buffaloes were examined for pregnancy per-rectum 45 days post-AI. The effects of treatment on induction of estrus and estrus induction interval, conception rate, submission rate, service period and reproductive efficiency were worked out for all the treated as well as untreated control group of buffaloes. The submission rate and reproductive efficiency were calculated using standard formulae.

The estrus induction response in buffaloes of Receptal treated Group-C was higher (83.33 %) than that of Tono-Vitacept treated Group-B (50.00 %) and Chelated mineral supplemented Group-A (42.85 %). The corresponding figures for oestrus induction interval were  $20.90 \pm 3.13$ ,  $27.14 \pm 3.74$  and  $40.83 \pm 4.04$  days, respectively. The overall conception rate was higher in Group-C (80 %) followed by Group-B (71.42 %) and Group-A (66.66 %). The significantly shorter oestrus induction interval ( $20.90 \pm 3.13$  days) with the highest conception rate (80.00 %), shortest service period ( $123.60 \pm 2.69$  days) and highest reproductive efficiency (66.66 %) were observed in Group-C buffaloes followed by those of Group-B, Group-A and control group. The corresponding values for Group-B were  $27.14 \pm 3.74$  days, 71.42 per cent,  $128.71 \pm 1.93$  days and 35.71 per cent, and for group-A  $40.83 \pm 4.04$  days, 66.66 per cent,  $137.83 \pm 2.63$  days and 28.56 per cent, whereas only 25.00 per cent (03/12) buffaloes of control group-D exhibited spontaneous estrus and two of them conceived with prolonged service period ( $151.00 \pm 14.56$  days) and poor reproductive efficiency (16.66 %). This showed that the improved reproductive performance was observed in postpartum anestrus buffaloes treated with Receptal (GnRH) followed by Tonophosphan plus Vitacept and Chelated mineral mixture supplemented

group. Hence, GnRH treatment which is economical is recommended to the practicing veterinarians.

The findings of the chelated mineral mixture supplemented Group-A compared with the reports of Singh *et al.* (2006) who recorded estrus induction response and conception rate of 47 and 72 per cent, respectively, following 30 to 50 days of mineral supplement among anestrus buffaloes. Nidhi *et al.* (2010), however, reported higher estrus induction and conception rate with the use of herbal heat inducer and area specific mineral mixture. Therefore, the improvement in reproductive efficiency of buffaloes in the present study might be attributed to the beneficial action of the supplementation with minerals on the neuro-endocrine axis and reproductive function (Smith and Akinbamijo, 2000). The estrus induction response and conception rate achieved following Tonophosphan plus Vitacept i/m treatment in Group-B buffaloes corroborated well with the report of Dabas *et al.* (1987), who recorded estrus induction response and conception rate as 50 and 80 per cent within 30 days following Tono-Prepaline therapy for 2 weeks. Butani *et al.* (2010), however, reported relatively higher estrus induction response (82.08 %) and conception rate (69.10 %) in anestrus buffaloes with Tono-Prepaline i/m plus intrauterine betadine therapy twice at weekly interval. Therefore, the findings of the present study and those of above researchers clearly suggest that nutritional deficiency or imbalance play a major role in causing infertility and hence, specific vitamin-mineral supplementation should be considered for treatment of postpartum anestrus buffaloes.

The present findings of 83.33 per cent estrus induction response and 80.00 per cent overall conception rate of 2 cycles with an average interval of 21 and 41 days after GnRH treatment, respectively, were quite appreciable as against only 25 per cent estrus expression and 66.66 (2/3) per cent conception rate found in untreated control group. These findings are in agreement with the reports of Nautiyal *et al.* (1997) and Khasatiya *et al.* (2004), and it partly corroborated with those of Mohammed *et al.* (1999) and Dugwekar *et al.* (2006), wherein, either estrus induction response



or conception rate were comparable with the present findings. Reddy *et al.* (1994) found lower estrus induction response (50 %) with only 40 per cent conception rate using 5 ml Receptal. El-Shamaa *et al.* (1996), however, found 57 per cent estrus response within 8 days of treatment with Fertagyl with 75 per cent conception at induced estrus. Shah *et al.* (2002) achieved estrus within 6 days as against 24 days in control group during peak breeding season using 250 µg of GnRH (Receptal) on day 40 postpartum in acyclic buffaloes. The findings of estrus induction response and conception rate clearly indicated that resumption of ovarian cyclicity with ovulatory estrus can be effectively induced with GnRH treatment in anestrus buffaloes under field conditions, thereby reducing their service period and calving interval towards achieving the goal of augmenting reproductive efficiency for better economic return.

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