

Fertility enhancement using *P-24* and fixed time artificial insemination (FTAI) protocol in repeat breeder buffaloes

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In dairy husbandry, a repeat breeder (RB) animal, one that does not conceive even after three inseminations, despite no clinically detectable reproductive disorders (Yusuf *et al.* 2010), causes huge economic loss to the dairy producer due to more inseminations, increased calving interval and increased culling rates (Gustafsson and Emanuelson 2002). Saxena (2004) reported 6 to 30% incidences of repeat breeding in India in buffaloes while Kumar and Singh (2009) reported 5.40%.

Timely intervention is necessary to enhance fertility and to curtail economic losses due to repeat breeding in cattle and buffalo. Oestrus synchronisation is a valuable tool to enhance fertility in repeat breeding buffaloes. Cloprostenol (Totewad *et al.* 2009) and norgestomet ear implant (Patel *et al.* 2003) were used for induction of oestrus in buffaloes. Hormonal treatments like, progesterone and GnRH alone or in combination were tried with variable success (Singh *et al.* 2004). Under this background, the present study was conducted to test the efficacy of *P-24* and fixed time artificial insemination (FTAI) protocol in improving conception rates in repeat breeding buffaloes.

Experimental design: Pluriparous Murrah buffaloes (20) maintained in the private farm and repeat breeding buffaloes brought to the clinic of the college with the history of failure to conceive following 3 consecutive artificial inseminations (AI) formed the experimental animals. All buffaloes were subjected to rectal palpation to rule out presence of any palpable genital tract abnormalities and White side test to rule out subclinical endometritis. The buffaloes were randomly divided into 2 groups. In control group (10), on day 0 and day 1 of the oestrous cycle, AI was performed with 2 doses of good quality frozen thawed semen. In

treatment group (10), CIDR was inserted intra vaginally for 9 days and removed on ninth day of insertion. Inj. PGF_{2α} (500 µg) was administered intramuscularly at 24 h prior to CIDR removal (*P-24*). Fixed time artificial insemination (FTAI) was carried out at 48 and 72 h after CIDR removal. In both control and treatment groups, pregnancy was confirmed by rectal palpation on day 60 post AI. The significance of differences among the variables was analyzed using Chi-square test.

Conception rate: Despite the fact that buffaloes are poor in exhibiting oestrus signs, oestrus signs with increased intensity were observed in treatment group. The conception rate for treatment group (*P-24* and FTAI protocol) was 70% (7/10) which is significantly higher than control group 20% (2/10).

The present study proved that: *P-24* and FTAI protocol increased the conception rate in repeat breeding buffaloes up to 70%. The protocol *P-24* refers to the time interval between PGF_{2α} administration and CIDR removal (24 h). CIDR acted as an artificial corpus luteum (CL) and elevated progesterone level in circulation. This elevated progesterone suppressed the pulsatile release of GnRH and LH thereby inhibited the maturation and ovulation of follicle in the ovary. Progesterone increased hypothalamus sensitivity to oestrogen with subsequent increase in the intensity of heat (Fabre-Nys and Martin 1991). Prostaglandin increased the pituitary sensitivity to GnRH and caused luteolysis of the pre-existing CL in the ovary, if any (Randel *et al.* 1996). Consequently, the drop in circulatory concentration of progesterone after CIDR withdrawal promoted the release of GnRH, followed by FSH and LH release with subsequent resumption of ovarian cyclicity (Zerbe *et al.* 1999). Therefore, when combined with CIDR, PGF_{2α} enhanced oestrus behaviour and conception rate. Hence, it is concluded that *P-24* and FTAI protocol could be effectively employed to improve conception in repeat breeding buffaloes.

SUMMARY

Pluriparous repeat breeding Murrah buffaloes (20) were

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randomly divided into 2 groups, viz. control and treatment group. Control group buffaloes were inseminated on day 0 and 1 of oestrus cycle whereas treatment group buffaloes were treated with P- 24 and FTAI protocol. A significantly higher conception rate was obtained in treatment group when compared to the control group. P-24 and FTAI protocol increased the conception rate in repeat breeding buffaloes.

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