



## Induction of Estrus and Fertility Response in True Anoestrus Buffaloes Using Intravaginal Progesterone Sponge During Summer

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### ABSTRACT

Present study was carried out to study the efficacy of intravaginal progesterone sponge for induction of estrus in post partum anoestrus buffaloes during summer. True anoestrus animals were identified by repeated rectal examinations twice at 10 days interval apart having the small and smooth ovaries without any follicular activity. Out of 40 animals identified, 30 were treated with intravaginal progesterone sponge for 10 days and PGF<sub>2</sub> injection was given one day prior to removal of sponge. Remaining 10 animals were kept as anoestrus control without treatment. The animals were watched closely for change in external genitalia after sponge removal and for estrus symptoms. The animals exhibiting estrus were inseminated artificially. Estrus was induced in 80% of animals (24/30) and the conception rate was 66.66% (16/24). This result indicates the better possibilities of inducing ovarian cyclicity in functionally anoestrus buffaloes by cost effective intravaginal progesterone sponge.

**Keywords:** Anoestrus buffaloes, Progesterone sponge, Conception.

The post partum anoestrus is a major factor for long calving intervals and low reproductive efficiency in buffaloes especially during summer. Heat stress is a well known problem causing huge economic losses to the buffalo breeders as well as dairy industry. Heat stress has a direct effect on breeding efficiency of female buffaloes and reduces the intensity and duration of estrus. Buffaloes with summer anoestrus fail to exhibit estrus as a result of ovarian inactivity. This is due to lower circulating concentration of hypophyseal and gonadal hormones and suboptimal functioning of hypothalamo hypophyseal and gonadal axis. The post partum cyclic activity depends on the synchronous activity of hypothalamic –pituitary-ovarian axis (Perea and Inskoop, 2008). The summer sterility can be overcome by raising progesterone level for 10-14 days in buffaloes under managemental conditions.

The present study was conducted in rural buffaloes to test the intravaginal progesterone sponges prepared

with locally available materials with a view to bring the buffaloes to oestrus cyclicity even during unfavourable summer season with a sole aim to breed the buffaloes throughout the year and its effect of conception rate in treated animals.

The present study was carried out in non descriptive rural buffaloes in Tirunelveli district of Tamil Nadu during summer season (March-June) when the mean ambient temperature and relative humidity ranged from 38-43°C and 50-60 per cent respectively. A total of 40 non descriptive true anoestrus buffaloes of third to fifth lactation that were not exhibiting estrus for more than 4 to 5 months after calving were selected for this study. Before the start of the experiment, the animals were confirmed as true anoestrus by absence of any cyclic functional structure (small and smooth ovaries without any follicular activity) on the ovaries by repeated rectal examinations twice at 10 days interval. These animals were divided randomly as



anoestrus control Group- I (n=10) and treatment Group- II (n=30). The selected animals were dewormed and supplemented with mineral mixture for one month prior to treatment.

All the animals were maintained on grazing and supplemented with paddy straw and concentrate feed; drinking water was provided ad lib.

A cylindrical progesterone sponge with dimensions of 8x5 cm was prepared using polyurethane foam sheet. 1.5 g of natural micronised progesterone (Susten, Sun pharmaceuticals, Gujarat) dissolved in absolute ethanol was loaded superficially on the sponge, autoclaved at 121°C, 15lbs pressure for 15 minutes and incubated at 37°C overnight.

and was inserted into the animals of group II and was left for 10 days whereas the group I served as control without any treatment. On the 9<sup>th</sup> day, PGF<sub>2</sub> α was injected and the sponges were removed on the 10<sup>th</sup> day. After the treatment, animals were closely observed for signs of any abnormal discharge and for estrus and the intensity of estrus were ranked on the basis of score card devised by Shrivastava (1997). The animals were inseminated twice at 12h interval and pregnancy was confirmed after three months by rectal examination.

Out of 30 animals treated, the sponges were retained in 28 animals (93% retention rate) and estrus symptoms were observed in 80% of the animals (24 of 28) at an average post treatment interval of 24-55 hours. In this study, out of 24 animals induced to estrus, 16 animals were pregnant after artificial insemination with a conception rate of 66.66% out of 28 animals treated with progesterone sponge, 24 animals showed estrus signs and 16 animals were pregnant with over all conception rate of 57% (16 of 28) (Table.1). In control group, no animal came to estrus. The animals which were not conceived were inseminated on the next estrus cycle and 6 animals were confirmed as pregnant.

Findings of this study concur with the Sreenan and Mulvehill (1975) who also reported that 7 per cent of treated buffaloes were failed to retain vaginal sponges. However, low retention rate was reported (62.50%) by Hill *et al.* (1992) in buffaloes. Srivastava (2005) and Reddy *et al.* (1994) reported 75 and 80 per cent estrus induction respectively in anoestrus buffaloes. Honparkhe *et al.*

(2008) and Patil (2003) observed 87.50 and 83.30 per cent induction rates respectively in anoestrus buffaloes treated with hydroxyprogesterone. Whereas Ayalon and Marcus (1975) observed 100 per cent estrus response in cows treated with progesterone intravaginal sponges. Kasbe *et al.* (2013) observed 63.63 estrus response and 63.63 per cent conception rate in post partum anoestrus local cows treated with 250mg of progesterone injection.

Anoestrus in buffaloes during summer is due to lower circulating concentration of hypophyseal and gonadal hormones and suboptimal functioning of hypothalamo hypophyseal and gonadal axis. Progesterone sponge was found to be more effective in summer anoestrus buffaloes by slow release of progesterone from the sponge and absorbed through blood vessel in vagina. It has a negative feedback effect on anterior pituitary gland to inhibit oestrus cycle (Thammakarn, 2010). When the sponge is removed from vagina, the progesterone in blood stream was decreased immediately and the reproductive cycle of cattle becomes active again.

The present study indicates that in rural buffaloes the intravaginal progesterone sponges can be effectively used to bring the buffaloes to estrus cyclicity even during unfavourable summer season with a sole aim to breed the buffaloes throughout the year with reasonably good conception rate and cost effectiveness.

**Table 1.** Retention rate, estrus percentage and conception rate in progesterone sponge treated summer anoestrus buffaloes

Number of animals treated	30
Retention of intravaginal sponge (%)	93% (n=28)
Estrus induction (%)	80% (n=24)
Conception rate	66.66% (n=16)

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