Application of Ovsynch Protocol for Fertility Improvement in buffaloes

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In India, buffalo is the principal milk-producing animal contributing more than 50% of total milk production in the country. It is a better dairy animal in comparison to cattle in terms of better feed (roughage) conversion efficiency, greater resistance to diseases, and, higher milk fat percentage. However, a major limitation with this species is its poor reproductive efficiency due to its late maturity, long post-partum period to cyclicity and poor estrus expressivity. Subestrus or silent estrus constitutes the largest factor responsible for poor reproductive efficiency in buffaloes. Apart from the weak manifestations of behavioural estrus, scanty mucus discharge in buffaloes substantially contributes towards the difficulty of visually detecting estrus. Proper heat detection is essential for artificial insemination (A.I.) practices so as to achieve maximum improvement in reproductive efficiency. To increase reproductive efficiency in buffaloes, like in cattle, various estrus synchronization protocols have been tried. The effectiveness of these protocols is however, dependent upon the precision of estrus detection. The use of two PGF$_{2\alpha}$ injections at the interval of 11 to 14 days is the most popular technique for estrus synchronisation in cattle. However its use for set time artificial insemination has been found to be inferior in terms of conception rates vis-à-vis conception rates after spontaneous estrus.

Scientists the world over are now working on developing new estrus synchronisation protocols which can reduce the ovulation time window post synchronisation so as to practise insemination at a fixed time thereby obviating the need for heat detection which is a serious problem especially in buffaloes. A new estrus synchronisation protocol (Ovsynch Protocol) in cattle has been developed recently; it makes the use of a combination of GnRH - PGF$_{2\alpha}$-GnRH injections which
has been reported to considerably narrow down the ovulation time to a range of 24 hours to achieve the maximum conception rate with set time artificial insemination.

The practical application of ovsynch protocol for fertility improvement in anestrus buffaloes belonging to the farmers’ herds has also been demonstrated in two trials by our Krishi Vigyan Kendra.

**The procedure**

The buffaloes (aneatrus/repeatbreeding buffaloes) are injected 2.5 ml of GnRH analogue (Receptal; M/s Intervet International GmbH) on any day intramuscularly; seven days later, 5 ml of lutalyse (M/s Upjohn, UK) was administered followed by a second dose of 2.5 ml of Receptal two days later. All animals were subjected to fixed time AI at 12 and 24 h post second Receptal administration.

In the first trial 60 anestrus buffaloes – ranging from 6 months upto 3 years - were selected from villages around Karnal. After a preliminary check up to rule out infections or pregnancies, the animals were subjected to Ovsynch protocol for induction of estrus followed by set time AI at 12 and 24 hours after the last GnRH injection. Animals which returned to estrus after treatment were bred either by natural mating or AI. While 24 buffaloes were declared pregnant (40%) another 28 buffaloes had become cyclic (47%). The success rate of the trial was 87%.
Practical Application of ovsynch (trial 1)

- 60 anestrous animals from the villages (6 months to 5 years)
- Ovsynch treatment administered
- 24 pregnancies (40%) at either fixed time AI or AI after subsequent estrus
- Another 28 buffaloes became cyclic (46%)

Buffalo which had not conceived for 5 years belonging to Mr. Suresh Pal, s/o Mr. Mahiram, Village - Pundrak was treated with ovsynch and declared pregnant.
The study was extended to another trial on 131 anestrus and repeat breeding buffaloes. The results of this trial are as under:

The overall incidence of pregnancies recorded was 67/131 (51.1%) either at fixed time AI or at subsequent estrus. This included 53 animals which were diagnosed anestrus prior to treatment and 14 animals which were repeat breeders. An additional 38 anestrus buffaloes responded to treatment by returning to cyclicity giving an overall success rate of (80%) to treatment in terms of either conceiving or returning to cyclicity.

**Results (second trial)**

- Total buffaloes treated with ovsynch: 147
- Data available for: 131 buffaloes
- Number of pregnancies: 67 (51%)
- Break up of pregnancies
  - Anestrus: 53
  - Repeat breeders: 14
Status of buffaloes subjected to ovsynch treatment (trial 2)

- Number of buffaloes not reported in heat prior to study: 101
- Number of buffaloes considered cycling on the basis of blood progesterone and rectal palpation observations: 16
- Number of buffaloes acyclic: 85
- Number of repeat breeder buffaloes: 30

Results

- Number of pregnancies among animals not reported in heat: 53/101 (52.4%)
- Number of repeat breeding buffaloes which became pregnant: 14/30 (46.6%)
- Success rate among heifers: 12/18 (66.6%)
- Pregnancies during summer trials: 49/98 (50%)
- Additional number of anestrus buffaloes which became cyclic: 38 (38%)
- Overall success (67 + 38 = 105; 80%)
Buffalo heifer (5 yrs old) became cyclic after one month of Ovsynch treatment (Owner Mrs. Krishini Devi wife of Mr. Prem Singh, Vill- Pundrak). The animal conceived at subsequent estrus.
**Conclusions**

The application of ovsynch protocol for fertility improvement in repeatbreeding and anestrus buffaloes belonging to the farmers’ herds is a useful biotechnique to enhance farmers’ incomes. Anestrus in buffaloes is one of the most serious reproductive problems affecting 30-40% of the total buffalo population. On a conservative estimate the country is losing 19-20 million tonnes of milk annually on account of anestrus in buffaloes. This amounts to a national loss of nearly Rs. 30000-40000 crores annually.

Hence, the ovsynch protocol for improving fertility in buffaloes holds promise especially since a) it can induce cyclicity in anestrus animals b) fixed time A.I. can be performed to avoid the necessity of estrus detection which is a serious limitation in buffaloes and c) enhance fertility in rural anestrus/repeat breeding buffaloes through increased conceptions and/or inducing cyclicity.

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