

## SYNCHRONIZATION OF OVULATION IN REPEAT BREEDING CROSSBRED JERSEY COWS USING GnRH AND PGF<sub>2</sub>α

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**Abstract:** The present study was designed to evaluate the effect of Ovsynch protocol in repeat breeding crossbred Jersey cows. A total of thirty four repeat breeding cross bred Jersey cows were subjected to Ovsynch protocol with timed artificial insemination. The pregnancy rate in Ovsynch protocol was 58.82 per cent where as it was 29.41 per cent in control group. Thus, the Ovsynch protocol can be effectively used to improve the pregnancy rate in repeat breeder cows.

**Keywords:** Ovulation Synchronization, Crossbred Jersey cows, Repeat Breeding.

### Introduction

Repeat Breeding Syndrome in cattle causes lowered pregnancy rate results in reduced milk production leads to great economical loss to dairy farmers. Repeat Breeding Syndrome is due to increased no of insemination, longer calving interval and increased culling rates. Incidence of repeat breeding syndrome in lactating dairy cows has been reported 10– 25 per cent. Causes of the repeat breeding syndrome may be due to genetic, hormonal and nutritional imbalance, subclinical infection of uterus, and early embryonic mortality. Hormonal imbalance can be classified as pre-ovulatory and post-ovulatory. Subluteal levels of progesterone during the preovulatory period result in irregular, delayed or absent ovulation of dominant follicle. As well insufficient corpus luteum at postovulatory period leads to low progesterone level and delayed progesterone rising leads to embryonic loss. Also, repeat breeding syndrome increase by insufficient estrus detection and errors of timing insemination (Keskin Abdulkadir *et al.*, 2010).

Estrus synchronization and fixed time artificial insemination (AI) is a useful technique in breeding management especially in dairy cattle and it improves heat detection efficiency as well as improves the economy of the dairy farm. Poor rates of estrus detection leads to poor

conception rates make management of reproduction in lactating dairy cows a challenge in most dairy herds. Inadequate and inaccurate estrus detection is frequently a cause of cows becoming repeat breeders. Estrus detection is less than 50 per cent on many dairy farms; there is a substantial need for accurate and efficient heat detection. Utilizing a combination of estrus detection aids to improve both accuracy and number of animals getting inseminated in estrus will improve conception rates (Rorie *et al.*, 2002). To help producers for effective reproductive management, synchronization of estrus has been developed (Pursley *et al.*, 1995).

Ovsynch protocol is widely utilized in dairy herds because of the poor estrus detection commonly observed in high producing cows (Santos *et al.*, 2004). With the use of the Gonadotropin Releasing Hormone (GnRH) and prostaglandin (PGF<sub>2</sub>α) in Ovsynch protocol for estrous synchronization has been proved as a successful technique for synchronization of estrus in cattle and buffaloes (Amaya-Montoya *et al.*, 2007). (Thatcher & Risco, 1993) observed significant beneficial effects of GnRH on conception rates that ranged from 7 to 25 per cent. Many research had been conducted with PGF<sub>2</sub>α alone (1984 and Brito *et al.*, 2002) or in combination with GnRH and fixed time AI. Pursley *et al.*, (1995) observed that when PGF<sub>2</sub>α is administered on palpation of functional CL, about 60-70 per cent animals were in estrus within 4 days. The pregnancy rate achieved in relation to the usage of different protocols with fixed time AI in cows and buffaloes were observed between 30 and 50 per cent (Baruselli *et al.*, 2003). Hence the present study is designed with Ovsynch protocol and fixed time insemination to assess the pregnancy rate in repeat breeding crossbred Jersey cows.

### **Material and methodology**

Thirty four Jersey crossbred cattle were selected for treatment and the study was conducted at Veterinary College and Research Institute, Orathanadu. The body weights of the cattle ranged between 300-400 kg. Animals suffering from clinical reproductive problems like metritis, endometritis and cystic ovary were not included in this study. The selected crossbred jersey cows were randomly divided into two groups. Cows in group I (n=17) served as control and were inseminated during natural estrus. Cows in group II (n=17) were scheduled under Ovsynch protocol. After selection, all the animals were dewormed and supplemented with mineral mixture for 20 days before initiating treatment. Group II animals were administered 10 µg GnRH i.m. at Day 0, 500 µg of PGF<sub>2</sub>α i.m. at Day 7 and a second dose 10 µg of GnRH i.m. at Day 9. AI was done on day 10 and TAI was performed at 12 and 24 h after the

second-GnRH treatment. All animals were diagnosed for pregnancy via per rectal palpation on day 90 post A.I.

### **Result and Discussion**

The aim of the present study was to increase pregnancy rate in repeat breeding cross bred Jersey cows by eliminating the hormonal etiological factors like delayed ovulation and anovulation and also improper estrus detection and irregular insemination time by GnRH - PGF<sub>2</sub>α- GnRH treatment regime. The result revealed that the overall pregnancy rate for cows in the control group was 29.41 per cent (5/17). The overall pregnancy rate for cows in the treatment group was 58.82 per cent (10/17). Increase in the overall pregnancy rate (58.82 per cent) in the experimental Cow group was due to treatment with GnRH and PGF<sub>2</sub>α. Whereas overall pregnancy rate (29.41 per cent) was comparatively less in the control cow group. Fricke *et al.*, (2003) conducted a series of experiments on Ovsynch protocol and obtained pregnancy rate of 31 per cent. Similarly result was reported by Caraba and Velicevici (2013) as 57 per cent. The pregnancy rate achieved in relation to the usage of different protocols with fixed time artificial insemination in cows and buffaloes was observed to range between 30-50 per cent (Baruselli *et al.*, 2003).

Results obtained by Buhecha *et al.*, (2016) 58.33 per cent was comparable with our findings. In the present study the administration of second GnRH injection was 48 hrs after the PGF<sub>2</sub>α increased the pregnancy rate. This increase in pregnancy rate may be due to prevention of delayed ovulation as well as anovulatory defects. Ovsynch ensures a homogenous ovarian follicular status at induction of luteolysis. The benefit of synchronizations diminishes when the time between inseminations is longer, especially when estrus detection rates are low (Cabrera *et al.*, 2011). However, fertility response to the Ovsynch protocol is depending on the stage of the cycle when the initial GnRH is administered. Initiation of the program during mid diestrus (days 5–12 of the cycle) improves conception rates in lactating dairy cows because it increases ovulation of first wave (initiation on days 5–9) and the number of cows with high progesterone (>1 ng/ml) at the moment of the PGF<sub>2</sub> (Santos *et al.*, 2004).

Several hormonal treatments have been used to improve conception rate in repeat breeder cows. Percentage of cows that ovulated in response to the first GnRH treatment was higher in repeat breeders 70.9 per cent than in normal cows 49.2 per cent. Effect of Ovsynch protocol on pregnancy rate in repeat breeders probably originated from greater response to each hormonal administration. For instance, percentage of cows responded to first GnRH of Ovsynch was found to be 70 per cent in repeat breeders and greater than normal cows (47per

cent). Early studies showed that response to the first GnRH of the Ovsynch was 50 to 70 per cent in normal lactating dairy cows. Increased ovulatory response of repeat breeder cows to first GnRH of Ovsynch when compared to normal cows might be coincident or it can be explaining that repeat breeders cows are sensitive to GnRH treatments. Ovulatory response to GnRH increased dose depended in repeat breeder cows and pregnancy rate was found to be greater when GnRH dose increased (Keskin Abdulkadir *et al.*, 2010). GnRH treatment ensures timely ovulation as well as efficient progesterone support for embryonic development results in better conception in repeat breeding buffalo (Savalia *et al.*, 2014).

### **Conclusion**

The major limiting factor for optimum reproductive performance on many farms is failure to detect estrus in a timely and accurate manner. The use of GnRH in association with PGF<sub>2</sub>α improves the efficiency of fixed time artificial insemination as it synchronizes ovulation and it overcome the problem of heat identification. Usefulness of Ovsynch protocol for improvement of pregnancy rate in crossbred jersey cows is a successful breeding programme.

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