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## Management of true anoestrus in crossbred jersey cows using nutritional and hormonal supplements

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### Abstract

A study was conducted to compare the efficacy of nutritional and hormonal supplements for treatment of true anoestrus in crossbred jersey cows based on estrus induction response and post treatment conception. The response rate to different treatment regimen in terms of manifestation of external signs of oestrus was recorded as 85.71, 57.14 and 100% in group A (supportive treatment with only minerals and vitamins), B (supplemented with hormones) and C (supplemented with both supportive and hormones) respectively. The overall conception rate was higher in group C (85.71%), group A (83.33%) and lower in group B with 50%. There was no significant difference in conception rate between groups A and C pertaining to conception rate. It was concluded that the supplementation of minerals and vitamins play an important role in establishment of estrus and overall conception rate when compared to hormonal (Ovsynch) therapy alone.

**Keywords:** Anoestrus, crossbred jersey cows, conception, estrus response, hormones

### Introduction

Anoestrus is one of the most commonly occurring reproductive problems in cattle and buffalo in India, affecting livestock productivity and economics to a great extent (Kumar *et al.*, 2014) [5]. The optimum production from dairy animals is dependent upon efficient reproduction and is often measured by number of offspring per breeding per unit of time (Bora *et al.*, 2014) [3]. The major reproductive disorders of economic importance in cattle are repeat breeding and anoestrus. Anoestrus is a broad term that indicates the lack of expression of estrus (or absence of estrous signs), despite efficient estrus detection. It is usually characterized by a lack of ovarian progesterone production (Manisha *et al.*, 2022) [6]. Anoestrus is a multicausative factors associated problem but its occurrence signals the inadequate nutrition, environmental stress, uterine pathology and improper managemental practices. Anoestrus condition is generally observed after parturition when the animal suffers from negative energy balance. Underfeeding for prolonged period causes failure of follicular development. Inactive ovary, also called as true anoestrus is a condition in which the ovaries are quiescent without signs of cyclicity or cycle related ovarian structures. In this study, attempts have been made to treat true anoestrus crossbred jersey cows by using hormonal preparations and nutritional supplements.

### Materials and Methods

The present study was conducted at Veterinary Dispensary, Butchayyapeta, Visakhapatnam in crossbred jersey cows of which a total of 21 true anoestrus animals were selected based on cows, which were not showing signs of estrus even after four months of calving and failing to reveal distinctly palpable corpus luteum on the ovaries with normal uterus. The true anoestrus animals were divided into 3 groups and treated as per the plan. In Group A, 7 animals were given supportive treatment comprising of minerals and vitamins in the form of mineral mixture (Agrimin forte) @ 50 gm/day/animal for 15 days, Injectable Phosphorus (Vetphos) @ 10 ml Vitamin A (Intavita H) @ 5 ml intramuscularly once in 3 days for three occasions. In Group B, 7 animals were undergone ovsynch protocol with 20 µg Buserelin acetate (5 ml) on 0<sup>th</sup> day, 500 µg Cloprostenol (2 ml) on 7<sup>th</sup> day, 10 µg Buserelin acetate (2.5 ml) on 9<sup>th</sup> day and double artificial insemination on 10<sup>th</sup> and 11<sup>th</sup> day. In Group C, 7 animals were subjected to both supportive treatment and Ovsynch.

Presence of vaginal mucus discharges and moderate to good uterine tone were considered as the genital changes indicative of estrus response in the animals post treatment in the present study. All the animals in the treatment groups were inseminated artificially and pregnancy was confirmed within 3 months.

### Results and Discussion

The estrus response rate was 85.71, 57.14 and 100% in group A, B and C respectively (Table 1). It was assumed that the animals supplemented with vitamins and minerals along with hormones showed high estrus response rate and the animals which were given only vitamins and minerals also showed more or less similar estrus response. Further the conception rate in group A, B and C was 83.33, 50, 85.71% respectively (Table 1). There was no significant difference in conception rate between groups A and C, while least conception rate was noticed in group B. Islam *et al.* (2013) [4] using GnRH and PGF2 $\alpha$  for the treatment of postpartum anoestrus in cows obtained 75.00% oestrus response rate which is higher than the estrus response (57.14%) observed in the current study. Use of Ovsynch protocol resulted in 100% estrus induction response in anoestrus Gir cows but the subsequent conception rate was only 50.00 percent (Ramakrishnan *et al.*, 2012) [7] which was like the present study. According to Shakkarpude *et al.* (2013) [8] pattern of reproduction in crossbred cows was

influenced by certain blood biochemical parameters of physiological significance. Calcium: phosphorus ratio alteration was also found to affect ovarian function leading to reproductive disorders (Yasothai, 2014) [9]. From this study, it was concluded that nutrition plays a crucial role in bringing the animal into estrus and overall pregnancy rate. It is also known that energy status of the animal modulates secretion of hormones that play key role in growth of ovarian follicle, ovulation, corpus luteum formation and fertilization (Bisisnitto *et al.*, 2012) [2]. If there is shortage of feed during this transition period of the animal, it will lead to negative energy balance (NEB) which will ultimately affect the follicular growth and will hamper the normal cyclic events of the animal. Anestrus is also linked to mineral deficiencies such as calcium (Ca), phosphorus (P), copper (Cu), zinc (Zn), and manganese (Mn). Minerals play an intermediate role in the activity of hormones and enzymes at the cellular level, and their shortage has been shown to impact female reproduction rates (Manisha *et al.*, 2022) [6]. Females with restricted intake of energy have decreased levels of LH secretion, which is the hormone that signals ovulation (Bischoff *et al.*, 2018) [1]. Addition of fat, minerals and vitamins in the diet improves body condition of the animals. Increased level of fat in the diet also increases secretion of reproductive hormones. These hormones are considered as the indicators of energy level in animals.

**Table 1:** Showing estrus response rate and conception rate

Treatment groups	No. of Animals taken	No. of animals exhibiting estrus	Estrus response rate (%)	No. of animals conceived	Conception rate (%)
Group A	7	6/7	85.71	5/6	83.33
Group B	7	4/7	57.14	2/4	50
Group C	7	7/7	100	6/7	85.71

### Conclusion

From the current study, it was concluded that supportive treatment with vitamins and minerals was effective in management of true anoestrus cattle. It was further observed that better estrus response and conception can be achieved when supportive therapy along with hormones were also given in true anoestrus crossbred jersey cows. These findings led to a conclusion that fortification of hormones along with supportive therapy was advantageous over hormones alone for the treatment of true anoestrus in crossbred cows.

### Declaration

The authors have no conflict of interest

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