



Efficacy of oral feeding of combined preparation of progesterone and oestrogen on the induction of oestrus in Frieswal females

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Received: 6 March 2011; Accepted: 3 June 2011

ABSTRACT

Delayed puberty and prolonged anoestrus are the most frustrating problems in crossbred cattle. To overcome this problem in Frieswal females 3 trials were conducted. In the first trial 7 heifers having mean age 23.6 ± 2.4 months were fed a combination of progesterone and oestrogen (1.2 mg levonorgestrel + 0.24 mg ethinylestradiol) along with a mineral mixture @ 40g/day/head for 10 days. In the second trial same treatment was repeated in 10 heifers (mean age 28.2 ± 2.32 months). In the third trial 20 Frieswal females having mean age 56.59 ± 5.50 months were fed combined preparation of progesterone and oestrogen (1.2 mg norgestrel + 0.24 ethinylestradiol) per day along with 50g of mineral mixture chilled/head/day for 10 days, whereas 6 heifers were kept as control.

Oestrus was observed daily twice in the morning and evening throughout the experimental period with the help of a teaser bull. It was observed that trial in 1, 2 and 3; 71.4, 70.0 and 80% females exhibited oestrus within 45 days. However, in control group only 33% heifers exhibited estrus after 11.5 ± 4.5 days. The estimation of copper and zinc indicated that concentration of these minerals were sub normal in all the treatment groups before the start of the experiment. These studies indicated that feeding of combined preparation of progesterone and estrogen can be used as the most economical and convenient method to overcome the problem of anoestrus in Frieswal females.

Key words: Anoestrus, Fertility, Frieswal heifers, Minerals, Progesterone

Delayed puberty and prolonged anoestrus are the most frustrating problems in crossbred cattle. The condition usually occurs due to temporary suppression of optimum levels of hormones needed to activate ovaries, and deficiency of minerals may also aggravate the problem. Oestrus may be induced in animals using progesterone (Willemse *et al.* 1982), progesterone with oestrogen (Britt *et al.* 1974, Shanker *et al.* 1996, Mathur *et al.* 2004) and by administering essential minerals and vitamins (Swensson *et al.* 1988). This experiment was conducted to know the efficacy of combined preparation of progesterone and estrogen fed orally in Frieswal heifers and cows through repeated trials.

MATERIAL AND METHODS

Frieswal heifers after attaining normal target body weight (>300 kg) and not exhibiting oestrus maintained at Military Dairy Farm, Meerut, under normal management and feeding practices, were taken for experimentation. All the heifers and

cows were examined per rectum twice at an interval of 11 days to know the status of genital organs. Females showing true anoestrus (smooth and inactive ovaries) were taken for each trial.

In the first trial 7 heifers with mean age 23.6 ± 2.4 months were fed levonorgestrel @ 1.2 mg and ethinyloestradiol 0.24 mg / animal/day for 10 days. In the second trial 10 heifers having mean age 28.2 ± 2.32 months, were fed the same combined preparation of progesterone and oestrogen mentioned in first experiment along with commercial mineral mixture @ 40 g/animal/day for 10 days.

In the 3 trial 20 cows with mean age 56.59 ± 5.50 months were fed the same combination as mentioned above along with 40g mineral mixture / animal/day for 10 days.

The estimation of Cu and Zn was done in the blood serum collected before the start of experiment from all the heifers in second trial by atomic absorption spectrophotometer after wet digestion in triacid (Raghuramulu *et al.* 1983).

All the heifers and cows used in this experiment were regularly observed for oestrus after the treatment at 12 h interval using a teaser bull. Animals detected in oestrus were inseminated using frozen thawed semen. Pregnancy was done by per rectal examination after 60 days. Heifers detected in

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Table 1. Oestrus exhibition in Frieswal females after oral, feeding of combined preparation of progesterone and oestrogen

Treatment	No. of animals	Age (month $\pm$ SE)	No. of animals came into oestrus (%)	Mean days taken for exhibiting oestrus
Levonorgestrel 1.2 mg and ethinyloestradiol+ mineral mixture 40 g/day for 10 days	7	23.6 $\pm$ 2.4	5(71.4)	21
Levonorgestrel 1.2 mg and ethinyloestradiol+ mineral mixture 40 g/day for 10 days	10	28.2 $\pm$ 2.32	7(70.0)	14.7 $\pm$ 4.99
Levonorgestrel 1.2 mg and ethinyloestradiol 0.24 mg+ mineral mixture 40 g/day for 10 days	20	56.59 $\pm$ 5.50	16(80.0)	27.7 $\pm$ 3.76
Control	6	31.5 $\pm$ 3.03	2(33.0)	11.5 $\pm$ 4.51

oestrus were inseminated using frozen-thawed semen. Data were analysed using δ^2 test as discussed by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

It was observed that during the first trial 5 out of 7 heifers responded to the treatment and exhibited oestrus after 21.0 days of treatment. Based on the results of first trial, second and third trial with the same drug combination along with 40g of mineral mixture per animal per days were conducted for 10 days in 7 and 20 anoestrus Frieswal heifers and cows of 28.2 and 56.59 months age.

Five heifers (71.4%) in first and 7 heifers (70.0%) in second trial exhibited oestrus after 21.0 and 14.7 days respectively. In control group only 2 heifers out of 6 exhibited oestrus after 11.5 $\pm$ 4.51 days (Table 1). These results confirm our earlier observations where we achieved 66.7% oestrus response from the same type of animals (Mathur *et al.* 2004). It was reported that progesterone and oestrogen combination was effective therapy for inducing oestrus in anoestrus buffalo heifers (Shanker *et al.* 1996). Anoestrus in buffalo was also treated by use of oral feeding of MGA followed by an oestradiol injection during normal breeding season (Pant and Gupta 1996). Similarly in a study better oestrus response in anoestrus crossbred heifer with oestrogen + progesterone was also reported by Thakur and Bhatt (1999). Our results also confirm the earlier report of induction of oestrus in heifers using combination of progesterone and oestrogen therapy (Gonzalez-Padilla *et al.* 1975, Faure *et al.* 1981, Dantre *et al.* 1988, Srivastava *et al.* 1999 and Mathur *et al.* 2004).

Induction of ovarian activity in postpartum cows were also achieved by utilizing progesterone treatment associated with oestrogen by various workers (Britt *et al.* 1974, Kumar *et al.* 2000). Youngquist (1998) had also reported that onset of oestrus in heifers reaching puberty may be hastened by treatment with implant of norgestomet and injection of oestradiol valerate. It was reported that progesterone alone was effective in inducing puberty in heifers, however a combined oestrogen and progesterone therapy was more effective (Gonzalez-padilla *et al.* 1975, Espinosa *et al.* 1986). The concentration of Cu and Zn in blood serum at the

start of third trial of experiment 2 was 413.63 $\pm$ 39.32 and 356.62 $\pm$ 28.48 and were in the normal range of variation. Perusal of details of these results obtained by various workers revealed that all these methods to overcome anoestrus in heifers are not as cost effective (economic) as compared to method used in this study. Hence, it may be concluded that feeding of levonorgestrel along with ethinyloestradiol along with mineral mixture is most convenient, economic and effective method to overcome the problem of anoestrus in Frieswal females.

ACKNOWLEDGEMENTS

Authors are thankful to Director PDC and Director Freiswal Project for providing necessary facility to conduct this work at Military Farm, Meerut.

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