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Effect of herbal therapy on delayed ovulation in cows

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Abstract
Twelve repeat breeding cows were brought with the history of prolonged estrus for more than 2 days and not get conception even after multiple inseminations. These cows were divided into two groups. Group 1 had a injection of GnRH to induce ovulation and Group 2 was advised with feeding of 100 g of curry leaves and 100 g of moringa leaves from the day of presentation. Ovarian study was done for consecutive five days. Artificial insemination was done daily till the day of ovulation. Ovulation rate and conception rate was found to be higher in treatment group 2 compared to treatment group 1.

Keywords: Repeat breeding syndrome, delayed ovulation, moringa leaves, curry leaves, GnRH

Introduction
Dairy farming is widely distributed among the farmers of our country. A calf a year becomes the motto of dairy farming. Repeat Breeding syndrome is one of the reasons for increased intercalving period. Repeat breeding syndrome cause substantial economic loss to the farmers and dairy owners. Ovulation usually occurs in cows 12 to 18 hrs after end of estrum or 25 to 35 hours after onset of estrus behaviour. Ovulation is said to be delayed if dominant follicle is not ovulated up to 48 hours after onset of behavioural estrus. Delayed ovulation may affect fertilization and conception rate (Bostedt *et al*, 1976) [1]. Many authors concluded that delayed ovulation as one the causes for Repeat Breeding syndrome (Lee *et al*, 1983) [2].
Some authors concluded that delayed ovulation cause non-synchronous hormonal change and altered uterine environment which results in embryonic mortality (Maurer *et al*, 1982) [3]. Ovulation can be hastened in these animals with the use of GnRH or hCG. Ovulation can also be hastened with oral ethno-veterinary medicines (EVM) like combination of moringa leaves (*Moringa oleifera*) and curry leaves (*Murraya koenigii).* Plants and its various parts have long been used in food that has therapeutic effects in various body systems. Combination of various plants such as moringa leaves, curry leaves, aloe vera and adamant creeper has been reported to induce estrum in anestrus cattle (Senthilkumar *et al*., 2021) [7]. The objective of this study is to know the effect of the above said EVM combination on delayed ovulation and to compare it's efficacy with GnRH.

Materials and Methods
Eight Jersey crossbred cows and four Holstein Friesian crossbred cows were brought to the Large Animal Gynaecology Unit of Veterinary Clinical Complex, VCRI, Namakkal in the last six months from 02.01.2023 to 28.06.2023. All cows were presented during their estrum for Insemination. All the twelve cows are pluriparous and calves approximately 7 months back then. All the twelve cows had 3 to 6 inseminations after their last calving. Farmers reported that these cows showed prolonged estrus signs even after the day of insemination. All the cows were clinically normal with good bodily condition. Rectal examination revealed relaxed cervix with toned uterus. Cervical mucus was collected and white side test was done with 5% Sodium hydroxide. All are negative for subclinical endometritis.
Transrectal Ultrasonography was done and presence of dominant follicle was noticed. Ovarian studies were done in all cows on day 1, 2, 3 and 10. Treatment Group 1 (n=6) was administered with Inj. Gynarich – 10 mcg IM per cow on the presented day. Follicular tracking was done with the aid of ultrasonography. Artificial insemination was done until ovulation.

Two of six cows ovulated on day 2 and four ovulated on day 3. Treatment group 2 (n=6) were fed with 100 g of *Moringa oleifera* leaves, 100 g of *Murraya koenigii* leaves and jaggery for three days. Two cows from Group 1 and three cows from group 2 were verified with pregnancy after 45 days with transrectal ultrasonography.

Results and Discussion

Table 1: Ovulation study and pregnancy verification details

	Group- I		Group- II	
Ovulation day	DAY 2	DAY 3	DAY 2	DAY 3
No. of animals ovulated	2	4	3	3
No. of animals pregnant	2 (33.33%)		3 (50%)	

Out of six cows treated with curry leaves and moringa leaves, three cows were found to be ovulated on day 2 and three on days 3. Three cows in this group was verified positive pregnancy. But, out of six cows treated with Inj. GnRH, two cows were found ovulated on day 2 and four cows on days 3. Only two out of six cows were verified with positive pregnancy.

Delayed ovulation itself is not a cause for infertility in cows. Artificial insemination done 12 hrs after onset of behavioural estrus in case of delayed ovulation may result in aging of sperm and result in infertility (Van Rosenberg *et al*, 1962) [8]. GnRH can be administered at the time of insemination to prevent ovulatory failure and to reduce the interval between insemination and ovulation (Nakao *et al*., 1984) [9]. GnRH can induce changes in function of follicle and corpus luteum indirectly through secretion of LH or FSH (Thatcher *et al*., 1993) [5].

Combination of Moringa, Hadjod stem and curry leaves were improved the follicular maturation and ovulating capacity (Elamaran *et al*., 2018) [17]. Leaves of moringa increasing the secretion of ovarian hormones (Ogunsola *et al*., 2017) [11] and rich in phytosterols (Stigmasterol) which is precursor of steroid hormone (E_2) production (Mutiara, 2013) [10]. Curry leaves contains highly nutritious, vitamins, carotenoids, protein, iron & potassium (Verma, 2021) [12]. Curry leaves are rich source of Calcium, Iron and Phosphorus (Shantala, 2005) [16].

Murraya koenigii helpful against oxidative stress & lipid peroxidation action (Mitra *et al*., 2012) [13] and also it was rich in phytoestrogen namely genestein which was binds with estrogen receptors (Kumi-Diaka *et al*., 1998) [14]. Higher steroidogenic activity (Oestradiol 17 β in ovaries) was reported in curry leaves which stimulate granulosa cell mitosis which aids in follicular development (Mehrotra *et al*., 2004) [15]. Senthilkumar *et al*., (2021) [7] reported usefulness of curry leaves and Moringa leaves in estrus induction.

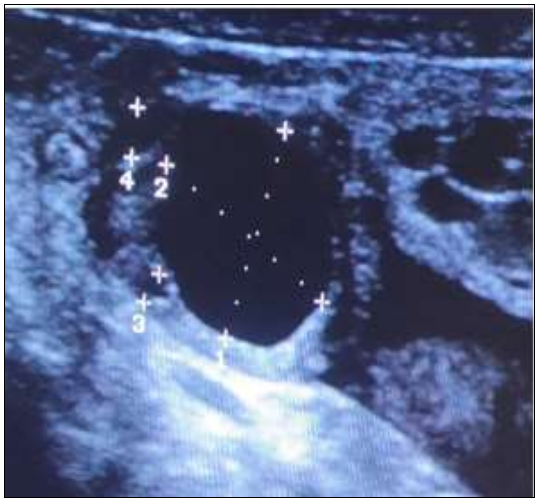

Fig 1: Dominant follicle with 10.28 mm diameter (Day 1)

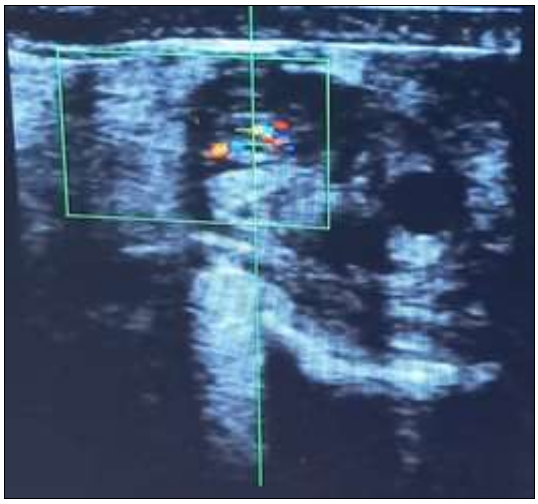

Fig 2: Ovulation site (Day 3)

Fig 3: Corpus luteum with 17.44 mm diameter (Day 10)

Conclusion

The combination of curry leaves and moringa leaves increased the ovulation rate and conception rate. Hence it is concluded that the combination of curry and moringa leaves was good remedy to tackle delayed ovulation in cows.

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