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RESEARCH ARTICLE

Ovarian response after treatment with herbal estrus inducer and trace mineral supplement in postpartum anestrus in crossbreed cows.

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Abstract

The current study was designed to evaluate the efficacy of herbal estrus inducer products on post partum anestrus cows. 18 experimental crossbreed cows were selected on the basis of clinical signs, history, rectal palpation & ultrasonography at organized university farm, Nagpur Veterinary College (MS). Cows were randomly divided into three groups. Group T0 (control, n=6) not given any treatment. Group T1 (n=6) treated with Estrofarm powder @7.5g/day for two days along with trace mineral supplement Mintrus tablets @1tab./day daily for twenty days orally. Group T2 (n=6) treated with Prajana capsule @3cap./day for two days along with trace mineral supplement tablets CoFeCu @1tab./day daily for twenty days orally. Parameters viz. estrous response, number of treatments required, duration of estrus, time of onset of estrus, nature of discharge, number of (AI) Artificial Insemination required, conception rate, pattern of follicular development were studied during the trail. Analysis of results revealed that, in Group T1 (treated with Estrofarm powder and Mintrus tablets) had improved estrous response, duration of estrus, time of onset of estrus, conception rate and size of the follicle followed by Group T2 (Prajana capsule and CoFeCu tablets) and control Group T0. Also for estrus response required treatment dose and number of AI dose required for conception reduced in Group T1 followed by Group T2 and control Group T0.

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Introduction:-

Dairy herd profitability is directly related to milk production and maximum daily milk production over the lifetime of a cow can only be achieved by ensuring optimal calving intervals (Gatius *et al.*, 2008). Perhaps increased partitioning of energy to milk production can result in anestrus by delaying resumption of follicular activity. However, factors such as limited energy intake, lower body reserves, and postpartum diseases can also delay the return to cyclicity (Peter *et al.*, 2009). Postpartum anestrus is more marked in beef than in dairy cattle (Galina and Arthur, 1989; Montiel and Ahuja, 2005). In cattle, anestrus and infertility in the postpartum period were recognized as a problem for the first time more than 60 years ago (Short *et al.*, 1990). Conception must occur by approximately 85 days after calving for cows to maintain yearly calving intervals. If postpartum anestrus persists at initiation of breeding seasons, time of conception may be delayed or cows may fail to conceive during the breeding season, and this increases culling rate in herds and decreases net income of producers (Fike *et al.*, 1997). Postpartum anestrus is the period after parturition during which cows do not show behavioral signs of estrus. The anestrus condition is associated with the presence of static ovaries, and even though there is follicular development, none of the ovarian follicles that start growing becomes mature enough to ovulate. So, due to this, lack of follicular maturation, ovulation does not occur while anestrus is present (Moro *et al.*, 1994; Montiel and Ahuja, 2005). Prolonged postpartum periods of anestrus (>150 days) are characteristic of Bos indicus and Bos taurus/Bos indicus cattle of

tropical regions; in this type of cattle prolonged postpartum anestrus is one of the main infertility problems due to its great incidence and results in economic losses due to failure to achieve a desirable inter-calving interval of 12 months (Escobar *et al.*, 1982). Reduced feed intake during late gestation or/and early postpartum period or negative energy balance (NEB) due to very high metabolic load following parturition especially in high yielders delays postpartum restoration of LH action, resulting into prolonged postpartum anestrus (Connor *et al.*, 1990; Hegazi *et al.*, 1994; Priya *et al.*, 2014).

Hormonal treatments for induction of oestrus are widely adopted but at same time have severe side effects. The deliberate use of hormones in healthy domestic animals has probably more impact on the animals that endocrine disrupters acquired from the environment (Sivertsen, 2006). It is proposed to induce estrus with herbal drugs in post partum suffering animals (Patil *et al.*, 2011). Hence, the present study was undertaken to study the efficacy of combination therapy of herbal products estrus inducer on post partum crossbreed cows.

Materials & methods:-

The clinical trial was conducted at the Department of Animal Reproduction, Gynecology & Obstetrics, Nagpur Veterinary College, MAFSU, Nagpur (MS), to study the effect of herbal estrus inducer products on post partum anestrus crossbreed cows.

18 crossbreed cows were selected with the history of post partum anestrus from organized university farm Nagpur Veterinary College, MAFSU, Nagpur (MS), India. Cows were selected on the basis of clinical signs, history, rectal palpation and ultrasonography. All the animals were randomly divided into three groups as per the experimental design. Group T0 (n=6) not given any treatment. Group T1 (n=6) treated with Estrofarm powder @7.5g/day for two days and Mintrus tablets @1tab./day daily for twenty days orally. Group T2 (n=6) was treated with Prajana capsule @3cap./day for two days and tablets CoFeCu @1tab./day daily for twenty days orally. All the animals fed similar basal feed/ration as per the standard recommendations. Parameters studied, number of cows coming to estrus, number of treatments required for estrus induction, duration of Estrus (hrs), time of onset of estrus (days), nature of estrus discharge, number of AI (Artificial Insemination) required for successful conception, conception rate (percentage) and pattern of follicular development. The data was analyzed by using Completely Randomized Design (unequal) as per Sendecor and Cochran, (1967).

Results:-

Anestrus is the lack or absence of the expression of estrus. Insufficient energy and protein intake and insufficient body condition at calving are limiting factors (Williams, 1990). It is well established that minerals play an intermediate role in the action of hormones and enzymes at cellular level and its deficiency ultimately affect the reproductive performance of females (Priya *et al.*, 2014). Estrous responses percentage increased in Group T1 (66.67%) i.e. 4 out of 6 cows came in heat only after one treatment of Estrofarm and Mintrus followed by Group T2, (50%) i.e. 3 out of 6 cows came in heat and required two treatments. In Group T0 (16.67%) only 1 out of 6 cows came in heat. Onset of estrus phase was observed within 3-4 days in Group T1, delayed estrus phase of 4-5 days was observed in Group T2. Duration of estrus in Estrofarm and Mintrus treated Group T1 i.e. 22.13 hrs and duration of estrus i.e. 19.5 hrs was observed in Group T2. Nature of estrus discharge was found normal crystal clear / transparent in all groups. On an average single AI was required for successful conception was one and conception rate was 75% in Estrofarm and Mintrus treatment Group T1, whereas in Group T2, AI required for successful conception were two and conception rate was 66.67%. Mineral deficiency affects the ovarian functions, the follicular size in Estrofarm and Mintrus treated Group T1 was larger (more than 8-9 mm) in comparison to Group T2 animals (more than 4 mm).

Table 1:- Reproductive performance after treatment

Sr. no.	Parameters	Treatment Groups		
		T ₀	T ₁	T ₂
I	Estrous response (%)	1 (16.67)	4 (66.67)	3 (50.00)
II	Number of treatments required	----	1	2
III	Duration of Estrus (hrs)	18.5 ± 0.11 ^a	22.13±0.20 ^b	19.5±0.41 ^{ab}
IV	Time of onset of estrus (days)	---	3-4	4-5
V	Nature of discharge	Crystal clear	Crystal clear, transparent	Crystal clear, Transparent
VI	Number of AI	----	1	2
VII	Conception rate (%)	----	75.00	66.67
VIII	Pattern of follicular development	----	>8-9mm	>4mm

Mean with difference superscript varies significantly ($p \leq 0.05$).

Discussion:-

Fertility of the postpartum period is negatively influenced by the incidence of anestrus. The latter condition is characterized by the absence of estrous behavior. The minerals that affect reproduction in cattle are generally found within the trace element group, although deficiencies of calcium and phosphorus can also affect fertility (Yasoithai, 2014). A new product Estrofarm powder developed by Ayurved, which contains combination of different herbs namely *Citrullus colocynthis*, *Zingiber officinale*, *Piper nigrum*, *Linum usitatissimum* and many herbs. The use of *Citrullus colocynthis* as an important source of natural antioxidant agents (Zohra *et al.*, 2010). *Linum usitatissimum* used for retention of fetal membranes, silent estrous/delayed puberty, anestrus and also in postpartum problems (Uncini Manganelli *et al.*, 2001; Syed *et al.*, 2008). *Zingiber Officinale* possesses pro-fertility properties in male rats which might be a product of both its potent antioxidant properties and androgenic activities (Morakinyo *et al.*, 2008).

Mintrus contain Iron, Manganese, Selenium, Zinc, Cobalt, Copper and Iodine, which are very helpful in treatment of anestrus cases. Selenium deficiencies in females cause infertility, abortion and retained placenta and by deficiency of Copper, plasma estrogen is reduced by 48% (Pal, 2015). Selenium added to the basic diet restored both growth and reproductive capability. Zinc deficiency is associated with numerous mental, physical and reproductive disorders (Tuula, 2000). The effect on prostaglandin synthesis suggests that Zn deficiency have profound effect on reproductive cycle and pregnancy. Delayed puberty and lower conception rates, failure of implantation and reduction of litter size are also found in association with the zinc deficiency in feed. Iodine regulates the thyroid hormone mechanism. Thyroid hormones play an important role in normal reproductive function both through direct effects on the ovaries and indirectly by interacting with sex hormone binding proteins (Kris *et al.*, 2007). Deficiency of Manganese cause suppression of estrus, silent estrus, irregular estrous cycle, cystic ovary, poor follicular developments with delayed ovulation, increase in embryonic mortality and reduced conception rate. Delayed uterine involution irregular estrous cycle and decreased conception rate happened by deficiency of Cobalt (Sudhir *et al.*, 2011). Estrofarm powder contains estrus inducer herbs and Mintrus contains trace minerals which increase the function ovary and performance of animal.

Conclusion:-

Reproductive performance was significantly improved after herbal drugs treatment. The study showed that combination therapy of herbal estrus inducer- Estrofarm along with trace minerals supplement- Mintrus was efficacious for treatment of post partum anestrus in cattle. This combination can be recommended for effective treatment of post partum anestrus.

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