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RESEARCH ARTICLE

ROLE OF HERBAL SUPPLEMENT IN FACILITATING OVULATION INDUCTION IN COWS SUFFERING FROM POST PARTUM ANOESTRUS.

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Key words:-

Conception rate, discharge, ovulation,
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Abstract

A study was carried out to evaluate the efficacy of herbal formulation in inducing ovulation in cows suffering from post parturient anoestrus. A total of 18 cows suffering from post partum anoestrus were selected for the purpose of study and allotted into three different groups. Group T0 (n=6) was kept as control and fed standard diet. Group T1 (n=6) was treated with AV/OIP/22 @ 200g once daily along with standard diet. Group T2 (n=6) was treated with Brand A @ 200g once daily along with standard basal diet. Parameters viz. time taken for exhibition of estrus, nature of discharge pre and post treatment and conception rate were evaluated. Results revealed that there was significant increase in the no. of animals that exhibited estrus in the AV/OIP/22 treated group as compared to control. The conception rate was also found to be significantly higher in the AV/OIP/22 treated group T1 as compared to Brand A treated group T2. Thus, it can be inferred that AV/OIP/22 is highly effective in inducing ovulation in animals suffering from post partum anoestrus.

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Introduction:-

Reproductive performance is one of the most important factors determining the profitability of dairy herds. The failure of the modern-day dairy herds to achieve the optimal level of fertility is a major cause of reduced production efficiency for all various production systems (Opsomer and Crowe, 2014). The major limitation to the success of rebreeding after each calving is the presence of postpartum anoestrus in the cow herd (Ahmadzadeh *et al.*, 2011). The inability to detect oestrus and to mate the cows by 60 to 80 days after calving is a common problem among dairy farmers nowadays. It has been suggested that selection of cows for increased production may compromise reproductive performance by increasing prevalence of postpartum anoestrus or by reducing conception rates (Wheaton, 1993). The lack of ovulation of dominant follicles during the post-partum period is associated with infrequent luteinizing hormone (LH) pulses, with both suckling and low level of nutrition being implicated in the prolonged suppression of LH pulses in the absence of progesterone (Crowe, 2014). Income levels of farmers drastically reduce consequent upon lengthened calving intervals, lower / inputs or outputs / fixed costs ratios (Sol *et al.*, 1984), reduced milk yield, loss of calf crop, increased labor etc (Bellows and Short, 1994). In view of the need to address the problem of post partum anoestrus which is widely prevalent across the country and takes a drastic toll on economy of dairy farmers, the current study has been undertaken to evaluate the efficacy of herbal ovulation inducers in reducing the instances of post partum anoestrus.

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Materials And Methods:-

Experimental design:-

A trial was carried out in an organized farm at Anand district of Gujarat to evaluate the efficacy of AV/OIP/22 (M/S Ayurvet Limited) in inducing ovulation in post partum anoestrus cows. A total of 18 cows suffering from post partum anoestrus were selected for the purpose of study and allotted into three different groups. Group T0 (n=6) was kept as control and fed standard diet. Group T1 (n=6) was treated with AV/OIP/22 @ 200g once along with standard diet. Group T2 (n=6) was treated with Brand A @ 200g once along with standard basal diet. Parameters viz. time taken for exhibition of estrus, nature of discharge pre and post treatment and conception rate were evaluated.

Statistical Analysis:-

The data collected was analyzed by applying standard statistical methods described by Snedecor and Cochran (1971)

Results:-

Estrous response and duration of estrus:-

The number of animals that exhibited estrus were significantly higher in the AV/OIP/22 treated group T1 (five animals out of six animals exhibited estrus) as compared to the control group T0 (two animals out of six animals exhibited estrus). There was, however, no difference in the average duration of estrus between the treated group and the control group (table 1).

Table 1:- Estrous response and duration of estrus in the treated animals

Groups	No of animals	No. of animals Exhibited estrus	Average Percentage	Average Duration of estrus
Control group T0	6	2	33.33%	24 hrs
AV/OIP/22 treated group T1	6	5	83.33%	16-24 hrs
Brand A treated group T2	6	6	100%	12-24 hrs

Time taken for exhibition of estrus:-

The time taken for exhibition of estrus was minimum in AV/OIP/22 treated group T1 with two animals exhibiting estrus on 3rd day, two animals on 4th day and one animal on 7th day. However, in the control group, estrus by one animal was exhibited at a protracted length of 7th day (table 2).

Table 2:- Time taken for exhibition of estrus

Group	No. of cows exhibiting estrus.	Time taken for exhibition of estrus								Average Time taken for exhibition of estrus Mean S.E.
		1 st day	2 nd day	3 rd day	4 th day	5 th day	6 th day	7 th day	8 th day	
Control group T0	2 animals	-	-	One animal shows estrus on 3 rd day	-	-	-	One animal shows estrus on 7 th day	-	5.00 ± 0.00 days
AV/OIP treated group T1	5 animals	-	-	Two animals show estrus on 3 rd day	Two animals show estrus on 4 th day	-	-	One animal shows estrus on 7 th day	-	4.00 ± 0.00 days
Brand A	6	-	-	Two	One	One	One	-	One	4.83 ± 3.33

treated group T2	animals			animals show estrus on 3 rd day	animal shows estrus on 4 th day	animal shows estrus on 5 th day	animal shows estrus on 6 th day		animal shows estrus on 8 th day	days
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Nature of discharge:-

The nature of discharge post treatment period in control group T0 and AV/OIP/22 treated group T1 was clear with clear mucus hanging from the vulva. There was no discernable difference in the nature of discharge between the control group T0 and the AV/OIP/22 treated group T1. However in the Brand A treated group, the elasticity and viscosity of mucus is less as compared to the control group T0 and AV/OIP treated group T1 (table 3).

Table 3:- Nature of discharge

Groups	No. of animals	No. of animals exhibiting estrus	Nature of discharge
Control group T0	6	2	Clear discharge with ropy mucous hanging from the vulva
Control group T1	6	5	Clear discharge with ropy mucous hanging from the vulva
Control group T2	6	6	Clear discharge with ropy mucous hang from the vulva, But the elasticity and viscosity is comparatively less

Conception rate:-

In the control group T0, two animals conceived after A.I. In the AV/OIP/22 treated group T1, 5 animals showed estrus and four animals conceived after A.I. In the Brand A treated group T2, six animals showed estrus and four animals conceived after A.I. The conception rate was higher in the AV/OIP/22 treated group T1 as compared to the control and comparable with Brand A treated group T2 (table 4).

Table 4:- Conception rate of the control and treated groups

Groups	No. of animals	No. of animals conceived	Conception %
Control group T0	6	2	33.33 %
AV/OIP/22 treated group T1	6	4	66.66%
Brand A treated group T2	6	4	66.66%

Discussion:-

Citrullus colocynthus, a constituent ingredient of AV/OIP/22 is a rich source of flavonoids (Benariba *et al.*, 2013), isovitexin (Akhzari *et al.*, 2015), cucurbitans (Hatam *et al.*, 1989) and caffeic acid (Shokrzadeh *et al.*, 2013). The improvement in the estrus response may be attributed to caffeic acid which is known to inhibit nuclear factor kappa B (Akyol *et al.*, 2015), a transcription factor which brings about changes in m-RNA synthesis and have a negative effect on reproductive performance. (Manimaran *et al.*, 2016). A substantial body of research has pointed towards a link between decrease in (NF)-κB and a parallel increase of IκBα-protein (Paciolla *et al.*, 2011), which play important and conserved roles in immune and stress responses (Oeckinghaus *et al.*, 2009) and indirectly influence bovine reproduction. The improved estrus response may have also been brought about by the presence of flavonoids which are known to possess anti-oxidant property (Pietta, 2000) and improve reproductive health (Lessera *et al.*, 2015). Presence of isovitexin may also have played a significant role in bolstering estrus response as it is known to possess free radical scavenging activity (Khole *et al.*, 2016) and neutralize the peroxy free radicals that hamper the proper functioning of the reproductive organs (Agrawal *et al.*, 2005). Numerous studies have also shown that there is significant influence of inflammation on follicular development and function postpartum (Sheldon *et al.*, 2002). Lipopolysaccharides from bacteria such as *E.Coli* suppress the release of LH by the pituitary (Sheldon *et al.*, 2009),

which in turn leads to a smaller diameter of postpartum ovarian dominant follicles and as a consequence resulting in lower plasma estradiol levels. Cucurbitans, a phytochemical present in *Citrullus colocynthis*, is known to possess significant anti inflammatory property (Peters *et al.*, 1997) and act via suppression of TNF- α -induced inflammatory cytokines production interleukin-1 β (IL-1 β), interleukin-6 (IL-6), and interleukin-8 (IL-8) mRNA and protein expression in human synovocyte MH7A cells (Jia *et al.*, 2015). *Zingiber officinale*, also a constituent ingredient of AV/OIP/22 is known to possess anti-oxidant property (Ghasemzadeh *et al.*, 2010) and may aid in onset of ovulation in cows suffering from post partum anoestrus.

Conclusion:-

Administration of polyherbal formulation to the cows suffering from post partum anoestrus is effective in hastening the onset of estrous in those cows and also increase the chances of conception.

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