



## EFFECT OF VITAMIN E AND SELENIUM ON REPRODUCTIVE PARAMETERS OF FRIESWAL COWS

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### ABSTRACT

A total 32 apparently healthy advance pregnant Frieswal cows divided into 4 groups (Control group =8, Treatment group A=8, B=8, C=8) were selected to explore effect of vit. E and Se on their reproductive performance Each cow of Group A served as untreated group , Group B , C was treated with -tocopherol acetate -500mg and sodium selenite 15mg in micelle form intramuscularly thrice and twice , where as Group D treated with oral supplementation of -tocopherol acetate and sodium selenite Reproductive parameters revealed that cumulative milk yield of 300 days were highly significant ( $p < 0.01$ ) and time required for uterine involution, Service period were significant ( $p < 0.05$ ) after parturition as compared to untreated group.

**KEYWORDS:** - Frieswal cows, tocopherol acetate, sodium selenite, uterine involution, cumulative milk yield

### INTRODUCTION

Dairy industry plays an important role in the economy of India. India is the largest milk producer in the world; the production is 121 million metric tons close to 17% of the total world production (NDDB – India, 2010 -2011). Postpartum period is regarded as important in the reproductive life of cow because of its effect on the future fertility, reproductive problems in cattle are of significant economic concern in dairy farming.

Immunopotentiality with vitamin E and selenium significantly improves reproductive performance of cows in respect to uterine involution period, calving to estrus period and milk yield (Bayril *et al.*, 2015). Campbell and miller (1998) reported a reduction in number of days for resumption of estrus from 70 to 50 in dairy cows receiving 1000 IU vit. E per day.

### MATERIALS & METHODS

The present study was conducted on 32 frieswal cows of 1<sup>st</sup> to 7<sup>th</sup> parity in advance pregnancy of about 260-280 days belonging to military dairy farm, Mhow (M.P.), all

the cows were maintained under standard schedule of feeding and management condition. Previous history regarding parity, gestation period, previous breeding record, periparturient complications, period requirement for cessation of lochial discharge, 1<sup>st</sup> postpartum estrus, service period, service /conception, average milk yield per 100 days, mastitis if any recorded.

Two months before expected calving date, cows were kept separately into calving lines and those showing the sign of parturition were kept in calving boxes where they were retained for a week after parturition.

These 32 frieswal cows randomly divided into two groups

A) Control group

B) Treatment group

A) Control group – this group consisted of 8 apparently advance pregnant frieswal cows and no treatment was given to these cows.

B) Treatment Group –this treatment group consisted of 24 advance pregnant frieswal cows.

S. No	Groups	Treatment ( - tocopherol acetate @500mg and se sodium selenite @15mg)		
		1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose
1.	Control Group	No treatment		
2.	Treatment Group			
	Group A	2 <sup>nd</sup> -3 <sup>rd</sup> week prior to parturition	During 1 <sup>st</sup> week prior to parturition	Within 4 hrs after parturition
	Sub Group B		During 1 <sup>st</sup> week prior to parturition	Within 4 hrs after parturition
	Sub Group C	Administered 5mg/day oral supplementation of Vit. E And Se for 6 days, 15 days prior to parturition and subsequently the administration was repeated for 6 days after parturition.		

**Post partum observation**

To judge the efficacy of treatment; time of calving and occurrence of post partum complications like prolapsed, RFM, Pyometra, metritis and metabolic diseases was recorded in all 32 frieswal cows.

- a) **Gross uterine involution** - Observation for evaluation of gross uterine involution and duration with quality of lochial discharge were recorded on alternate day during extra pelvic state of genitalia and daily during intra pelvic state until size of uterus did not change on three successive examinations. The day after which the size of uterus did not changed was considered as the day of gross uterine involution (Studer and Morrow, 1980).
- b) **Time interval for appearance of first postpartum estrus** – all the cows were observed for estrus daily at 9 a.m. and 5 p.m. by skilled person and by parading a vasectomised bull.
- c) **Service period**– interval from calving to successful conception was recorded in all the animals.
- d) **Cumulative milk production of 100 days postpartum**- milk record register was screened to record 100 days cumulative production in all the 32 cows.

**RESULTS**

- a) **Duration for expulsion of fetal membranes in frieswal cows** - mean time required for expulsion of fetal membrane among different groups in frieswal cows are; it was minimum in group A (3.8±0.15) followed by group C (3.8±0.22) group B (4.1±0.18) and in control group (4.6±0.29) , which was maximum. The difference in time required for expulsion of fetal membranes among to the entire group was statistically non-significant.
- b) **Time required for cassation of lochial discharge**-The time required for cassation of lochial discharge among

different groups; it was minimum in group B (11.75±0.89 days) followed by group C (12.12±1.04 days) , group A (13±1.18 days) and maximum in control group(13.8±0.81 days). Statistically the time required for cassation of lochial discharge was non-significant between the all groups.

- c) **Time required for uterine involution** - Time required for uterine involution among different group; it was minimum in group C (26±0.62 days), followed by group A (27.3±0.65 days) and group B (28.5±0.84 days). The Time required for uterine involution was maximum in control group (29±0.75 day). Statistically analysis revealed significant variation among all the treatment groups (p<0.05).
- d) **Time required for appearance of 1<sup>st</sup> postpartum estrus**- it was minimum in group C (58.75±3.88 days) followed by group B (61.75±4.82 days), group A (62.87±3.29days) and Time required for appearance of 1<sup>st</sup> postpartum estrus was maximum in control group (62.65±2.19 days). On statistical analysis the variation was non significant in all the group
- e) **Service period** – service period was minimum in group B (61±5.4 days) followed by group A (78±7.8 days) group C (78.5±6.5 days) and was maximum in control group (91.1±3.6). Statistically the variation between the entire group (0<0.05) for service period was significant.
- f) **Cumulative milk yield of 300 days**- Cumulative milk yield of 300 days among different in frieswal cows by group (4074.7 ± 187.5) group B (3740.5±264.8), group I (3406.6±64.1) and was minimum in control group (2459.25±111.2). On statistical analysis the variation in cumulative milk yield of 300 days among different groups was highly significant.(p<0.01)

**TABLE 1:** Effect of vit. E and Se on reproductive performance of Frieswal cows

S No	Parameter	Group A	Group B	Group C	Control Group	F value
1.	Duration of expulsion of fetal membrane (hrs)	3.8± 0.15	4.1± 0.18	3.8±0.22	4.6± 0.29	2.545 <sup>NS</sup>
2.	Time required for cessation of lochial discharge (Days)	13 ±1.18	11.75±0.89	12.12±1.04	13.8±0.81	0.522 <sup>NS</sup>
3.	Time required for uterine involution (Days)	27.3±0.65 <sup>ab</sup>	28.5±0.62 <sup>a</sup>	26±0.84 <sup>b</sup>	29±0.75 <sup>c</sup>	3.372*
4.	Time required for appearance of 1 <sup>st</sup> postpartum estrus (Days)	62.87±3.29	61.75±4.82	58.75±3.88	62.65±2.19	0.602 <sup>NS</sup>
5.	Service Period (Days)	78 ± 7.8 <sup>ab</sup>	61±5.4 <sup>b</sup>	78.5± 6.5 <sup>ab</sup>	91.1±3.6 <sup>a</sup>	4.170*
6.	Cumulative milk production of 300 days partum (Liters)	3406.6 ± 64.1 <sup>b</sup>	3740.5±264.8 <sup>ab</sup>	4074.7±187.5 <sup>a</sup>	2459±111.2 <sup>c</sup>	13.489**

**DISCUSSION**

- a) **Duration of expulsion of fetal membrane in Frieswal cows (Hrs.)**– the expulsion of fetal membrane in Frieswal cows in present study required minimum time in Group I ( $3.8 \pm 0.15$  hrs.) followed by group III ( $3.8 \pm 0.22$  hrs.), group II ( $4.1 \pm 0.18$  hrs.) and is maximum in Control group ( $4.6 \pm 0.29$  hrs.), the difference between group for duration of expulsion of fetal membrane was non significant. The observation are in closed agreement with reports of Ratre (1998) who found time required for expulsion of fetal membrane  $3.87 \pm 0.78$  hrs, with normal parturition.
- b) **Time required for cessation of lochial discharge (Days)** – The time required for cessation of lochial discharge among different groups of Frieswal cows was minimum in group II ( $11.75 \pm 0.89$ ), group I ( $13 \pm 1.18$ ) and maximum in control group ( $13.8 \pm 0.81$ ). The present finding are in close approximation with the report of Tiwari *et al.* (2001) who reported comparatively less time for cessation of lochial discharge in vit. E and se treated group as compared to non treated group.
- c) **Time required for uterine involution-** time required for uterine involution among different groups in Frieswal cows was minimum in group III ( $26 \pm 0.84^b$  days), followed by group I ( $27.3 \pm 0.65^{ab}$  days) and group II ( $28.5 \pm 0.62^a$  days). It was maximum in control group ( $29 \pm 0.75^c$  days). The present finding are in close agreement with the reports of Hajurka *et al.* (2005) who also reported less time for uterine involution in selenium treated cows with metritis as compared to cows with metritis.
- d) **Time required for appearance of 1<sup>st</sup> postpartum estrus (Days)** - Time required for appearance of 1<sup>st</sup> postpartum estrus in Frieswal cows was minimum in group III ( $58.75 \pm 3.88$  days), followed by group II ( $61.75 \pm 4.82$  days), group I ( $62.87 \pm 3.29$  days) and was maximum in control group ( $62.65 \pm 2.19$  days). Similar observations were reported by Harrison *et al.* (1984) who reported that single injection of Se in combination with oral supplementation of vit. E before parturition significantly affected on day to first estrus after parturition in cows.
- e) **Service Period (Days)**–Service period among different groups of Frieswal cows in present study was minimum in group II ( $61 \pm 5.4^b$  days) followed by group I ( $78 \pm 7.8^{ab}$  days), group III ( $78.5 \pm 6.5^{ab}$  days) and was maximum ( $91.1 \pm 3.6^a$  days). The present finding are in close approximation with the reports of Arechiga *et al.* (1994) who reported prepartum supplementation with vit. E and Se reduce interval for calving to conception in with and without RFM.
- f) **Cumulative milk yield of 300 days** – Cumulative 300 days milk yield among different groups in Frieswal

cows was maximum in group III ( $4074.7 \pm 187.5^a$ ) followed by group II ( $3740.5 \pm 264.8^{ab}$ ), group I ( $3406.6 \pm 64.1^b$ ) and was minimum ( $2459 \pm 111.2^c$ ) in control group. Statistical analysis revealed highly significant difference between different groups. The present findings are in close agreement with reports of Pavlicek *et al.* (1979) who reported significant rise in milk yield from 755 kg to a record 6269 kg/cow with three doses of 400 mg tocopherol acetate and 10 mg sodium selenite administered at 21 and 14 days interval before calving.

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