

Serum Biochemical (Total Protein, Cholesterol) Status Before and After Treatment in Crossbred Cattle

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ABSTRACT

Present investigation was carried out on 24 infertile crossbred cows and divided in 2 groups viz. control and treatment group at BHU dairy farm. Cows were subjected to β -carotene incorporated mineral-vitamin supplemented for 45 days. Serum was separated from collected blood samples and analyzed for certain biochemical parameters cholesterol and total protein. These serum biochemical constituents were compared with serum levels in control group and treatment group and found higher in treatment group.

Keywords: Blood Biochemical, Cholesterol, Crossbred Cows.

INTRODUCTION

Minerals play an intermediate role in the promotion of action of hormones and enzymes at sub cellular levels in an integrated fashion and thus regulate functions of reproduction and production of domestic animals. Minerals like calcium, phosphorus, magnesium influence the ability of animal to utilise other micro minerals. Nutritional deficiencies in animals result into depletion of minerals and deranged enzymatic activity affecting the normal reproductive behaviour. Biochemical profile can indicate the nutritional status of the minerals and other constituents, and help in diagnosis and management of infertility in

animals. The anestrus condition in dairy cows not only affects the fertility of the cattle to a considerable extent but also incurs great economic loss to the farmer. Mineral imbalances or deficiency may be a factor responsible for anestrus condition in animals.

Certain biochemical constituents in blood serum during estrus period have found to be associated with the fertility status of cows and their reproductive behaviour. The findings of many authors suggest that normal blood levels of various biochemicals constituent are indispensable for normal function of various systems of body including reproductive system.

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The present study was undertaken to elucidate the relationship between certain serum biochemical including mineral status and repeat breeding condition in dairy cows. Changes in the levels of these metabolites have been associated with reproductive failures.

The attempts have been made to investigate the levels of serum cholesterol and total protein in crossbred cows so as to ascertain their possible involvement and usefulness.

MATERIALS AND METHODS

Place of work and animals

The study was planned and conducted on 24 cross-bred non-cyclic, non-pregnant cattle of B.H.U. dairy farm. Cattle, which were not observed in estrus for atleast six months considered as non-cyclic animals. On the basis of clinical observations, cattle affected with any kind of infectious causes or structural pathological abnormalities were excluded from the study.

Selection of cattle

Cattle were selected of same breed, all cattle are cross bred (sahiwal×H.F.) Age of all cattle was around 3-6 years. Body weight of all cattle around 350-500 kg. Body condition of cattle is good muscular, attractive, shiny hair coat and active eyes.

General management practices

Management practices are the main determinant of the expression of natural behavioural patterns of the animals and any alteration of this natural behavioural patterns lead to health disorders. Managerial practices followed in the present study have been discussed in different heading as follows.

Supplementation of feed

1. Rovimix Cal-P strong (DSM nutritional product) (each 100 g contain)

Minerals / Ingredients	Quantity
Calcium	26g
Phosphorus	14.25g
Rovimix vitamin B ₁₂	400mcg
Rovimix vitamin D ₃	16000 IU

Housing

The experimental animals were maintained in loose housing system under group Management practice with proper drainage, soft bedding, feeding and watering facilities. The feeding mangers were covered with shed type roof consisting of asbestos sheets at moderate height with low slope. At one corner of paddock, there was provision of drinking water trough with running tap water. The housing system is designed in such a way that it provides ample air movement and protects animals from extreme weather. Feeding manger and watering trough was as per BIS standard. This system of housing facilitated free movement, sufficient exercise to the animals and the animals exhibit their natural behaviour.

Feeding

The nutrient requirements of all experimental animals were mostly met with *ad libitum* green fodder and measured amount of concentrate. The green fodders, grown in the Institute farm, were supplied according to the seasonal availability. During summer and rainy seasons predominantly maize and sorghum were fed whereas in winter, fodders like barseem, oat, were fed. Feedings were spread in 3 to 4 feeding during day and night. The concentrate was fed @1.5 kg/day/animal for body maintenance in general. Concentrate mixture had 20% CP and 70% TDN consisted of 33% maize, 21% ground nut cake (oiled), 12% mustered cake (oiled) 20% wheat bran, 11% de-oiled rice bran, 2% mineral mixture and 1% common salt.

2. Rovimix ovn dairy premix (DSM nutritional products)

Mineral/Ingredients	Quantity
Rovimix vitamin-A	2.000 MIU
Rovimix vitamin-D3	0.400 MIU
Vitamin-E	20.000MIU
Biotin	0.400 gm
Niacin	10.000gm
Beta-carotene	10.000gm
Iron	12.000gm
Copper	4.000gm
Manganese	15.000 mg
Zinc	16.000gm
Magnesium	80.000gm
Cobalt	0.400gm
Iodine	0.300gm
Selenium	0.120gm
Chromium	0.500gm
Potassium	5.000gm
Sodium	6.000gm

Treatment Details:

1. 50 gm Rovimix ovn dairy premix (DSM nutritional products) in evening
2. 50 gm Rovimix Cal-P strong (DSM nutritional product) in morning

Collection of blood

About 10 ml of blood samples were drawn from the Jugular vein with 18g sterilized needles from each animal, (both experimental and control). Blood samples were transferred immediately in dry, sterilized glass test tubes and kept at 45°C angle in room temperature after proper coding.

Collection of serum

Serum samples were collected carefully into different sterilized micro-centrifuse tubes with the help of sterilized Pasteur pipettes and kept at -20°C temperature till analysis.

Biochemical Parameters

Serum total protein and cholesterol were estimated from each serum samples.

Estimation of serum total protein

The level of total protein was determined by the Biuret method as described by Wotton (1964).

Estimation of serum cholesterol

The level of serum cholesterol was estimated in Micro lab 200 Auto analyser using commercial kits.

Observations used for heat detection

All the cows were checked and parameters like duration of onset of estrous post protocol, total duration of estrous and the signs of estrous like-restlessness and mounting behavior, discharge and its amount, bellowing and tonicity of uterus were recorded.

Breeding

All cows were artificially inseminated with frozen semen of high fertility.

Statistical analysis

The Data obtained during investigation were subjected to statistical analysis using independent t-test.

RESULTS AND DISCUSSION

Investigation here to correct the reproductive performance of infertile cows has been tried with β -carotene incorporated mineral-vitamin premix.

Animals of the experimental treatment group responded well with the treatment scheduled. The percentage of animals had oestrus symptoms in treatment group were 50% with the mean interval of 22 days.

Total protein

Table : Status of Total protein (mg%) level in blood serum

Days	Mean±SE		P-value
	Control	Treatment	
0	7.79±0.27	7.82±0.17	0.463
45	7.24±0.17	9.31±0.14	0.000

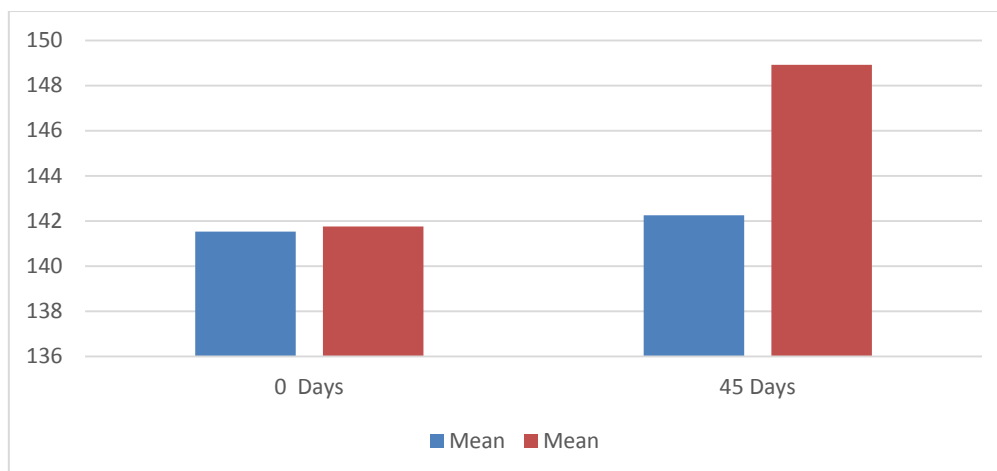


Fig : Diagram showing the status of total protein (mg%) level in blood serum

The serum level of total protein in anoestrus condition was 7.0886 ± 0.323 gm% where as it was 9.4614 ± 0.3147 gm% during oestrus condition. The observation corroborated with **Cholesterol**

the findings of Naidu and Rao (1982), Chetty and Rao (1986), Singh et al. (1996) and Kabir et al. (2001).

Table: Status of Cholesterol (mg%) level in blood serum

Days	Mean±SE		P-value
	Control	Treatment	
0	131.17±0.17	131.50±0.15	0.080
45	132.91±0.15	147.53±0.41	0.004

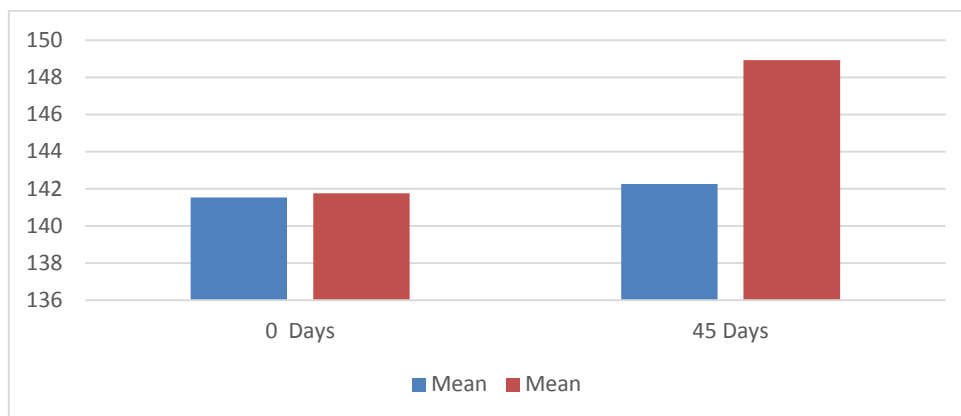


Fig: Diagram showing the status of cholesterol (mg%) level in blood serum

The serum cholesterol concentration of cows in anoestrus and oestrus condition were 131.57 ± 7 mg% and 147.29 ± 8.31 mg% respectively. Similar findings were reported by Murtuza et al. (1978). Dutta et al. (1988) and Cetin et al. (2002). The values obtained in this study was lower than that reported by Purohit and Kohli (1977), Aminuddin et al. (1984) and Sahukar et al. (1985) and higher than the finding reported by Sharma et al. (1984) and Kuma and Sharma (1991).

SUMMARY AND CONCLUSION

In the present study, total 24 infertile crossbred cows were selected to induce oestrus taken for correction of anoestrosity with β -carotene incorporated vitamin-permix. Total 8 out of 24 animals exhibited oestrus symptom after the treatment. Among the animals received β -carotene incorporated vitamin-permix (treatment group) 50% showed the oestrus symptoms. Among the animals under control 16.66% came into heat.

Estimation of serum total protein, cholesterol, major elements (Ca and P) and trace minerals (Mn, Cu, Zn and Fe) were performed At 0 days and 45 days.

In treatment group (β -carotene incorporated vitamin-permix) 6 animals came into heat. Serum total protein and cholesterol level was significantly higher (significant at 5% level) in oestrus condition than in anoestrus condition in this group.

In control group only 2 animal came into the heat. Here no parameter show any significant change in between the anoestrus and oestrus condition.

The observations for 12 cows of treatment group, provided with mineral mixture with beta carotene supplementation:

a) The blood serum level of total protein rose from 7.82 ± 0.17 mg% at day 0 to 9.31 ± 0.14 mg% at day 45 of feed supplementation.

b) The blood serum level of cholesterol rose from 131.50 ± 0.15 mg% at day 0 to 147.53 ± 0.41 mg% at day 40 of feed supplementation.

Therefore, following conclusions were drawn from this study

Blood biochemical profile and serum mineral concentration improve towards optimum health after supplementation of β -carotene.

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