

EFFECT OF AREA SPECIFIC MINERAL MIXTURE AND ANTIOXIDANTS SUPPLEMENTATION ON HORMONAL ESTIMATION OF BARBARI BUCKS

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Abstract: A study was conducted to assess the effect of area specific mineral mixture (ASMS) and antioxidant supplementation on serum profile of Barbari goats viz. Concentration of Testosterone, Concentration of Cortisol. Two year old 18 Barbari bucks were selected for the study purpose consisting six bucks in each treatment group by simple random sampling. The bucks were housed in semi-intensive system of housing. Bucks were stall fed as well as pastured. The animals were divided into three group viz. control group, treatment 1 and treatment 2. Control group were fed with 300 gm of concentrate feed per head per day for 60 days. Treatment 1 bucks were given with 20g of area specific mineral mixture along with 300 gm of concentrate feed per head per day. Treatment 2 bucks were given with 20g of area specific mineral mixture, selenium 0.5 mg, vitamin- E 250 mg, vitamin -C 2 mg in addition with 300 gram concentrate feed per head per day for 60 days. Blood samples were collected after completion of the experiments in all treatment groups at 2 – 3 days interval and blood parameters were studied. The results of this study revealed that serum Testosterone and Cortisol levels differed significantly ($P < 0.05$) between control and treatment groups.

Keywords: Barbari bucks, Testosterone, Cortisol

Introduction

Goats are the first domesticated ruminant animals. Goats are mainly reared by weaker section of the society providing them a good economical and nutritional security. As per 2018-2019 statistics, 13.53 per cent total meat and 3 per cent of total milk production was contributed by Goat meat and milk respectively with a total population of 148.88 million. India possesses 34 breeds of goat and its produce a variety of products viz. milk, meat, fiber (mohair and pashmina) and manure. Barbari goat is the one among the important dual purpose breed, which best suited for cold climate. Barbari goat is a dwarf goat mostly found in the north-western arid and semi-arid regions of Agra, Mathura and Kanpur district of Uttar Pradesh and Bharatpur district of Rajasthan, India. It is a breed having many good traits like high body weight, superior chevon quality, high prolificacy, high reproductive efficiency, good mothering ability, good adaptability and can be bred round the year [1]. Nutrition, stress, reproductive status, age, sex, genetics, management, housing, and other environmental factors (temperature, relative humidity etc.) are known to have a profound effect on the

hematological and biochemical profiles of small ruminants, [2] which are directly related to health of small ruminants. Biochemical and hematological variables of blood are generally used to monitor and evaluate health, nutritional and physiological status of ruminants [3]. The reproductive performance of an individual animal can be altered through supplementation of micro minerals and anti oxidants by nutrition, which can be assessed by Hormonal estimation. Keeping these in a view, the present study was undertaken to assess the effect of area specific mineral mixture and anti oxidant supplementation on biochemical profile of some serum parameters of Barbari bucks.

Materials and Methods

The experiment was conducted at experimental shed complex on Central Institute for Research on Goat (C.I.R.G) Makhdoom, Mathura, Uttar Pradesh, India. Barbari bucks were used for the experiment. All the experimental bucks were marked with horn colour for easy identification. Subsequently Bucks were distributed randomly into one control group and two treatment groups, keeping initial body weight in consideration. The bucks were housed in semi intensive system of housing.

They were kept in well ventilated individual pens (3 x 5 Sq.ft) with mud floor and provided uniform housing. Bucks had been pastured as well as stall fed. They were set on pasture both dawn and dusk during whole study period. Pasture used for grazing contained mainly Doob grass (*Cyanadonda ctylon*), Berseem (*Trifolium alexandrium*), Athua (*Chenopodium album*), Oats (*Avina sativa*) and leaves of Neem (*Azadirachta indica*), Poplar (*Populas alba*) and Ber (*Zizphus indicus*). After feeding each group was turned out for natural grazing for 4 hrs. The experiment was continued for 60 days.

All experimental animals were pure Barbari goats. Animals were divided randomly into three groups (6 in each group) on basis of initial body weight (32 ± 2 kgs) and kept almost same in every group. First group was kept as control and was fed with concentrated feed of 300 gram without mineral mixture or any kind of mineral supplementation, per head per day for 60 days. Second group (Treatment 1) was fed with 300 gram of concentrated feed fortified with 20g area specific mineral supplementation and Third group (Treatment 2) was fed with 300 gram of concentrated feed added with area specific mineral mixture 20g with selenium 0.5 mg, vitamin- E 250 mg, vitamin -C 2 mg, per head per day for 60 days. Vaccination and Deworming were carried out as per standard schedule and was carried out untill the end of experiment.

Necessary blood samples were collected from jugular vein in heparin coated vials at 2,4,7,9,11,14,16 and 18 days after the study period from each animal. Serum testosterone concentration in blood serum was estimated with Span Diagnostic Kit at 450 nm wavelength and expressed in ng/ml. Serum Cortisol concentration in blood serum was estimated with Span Diagnostic Kit at 405 nm wavelength and expressed in n mol/ml.

Results and Discussion

1. Serum Testosterone (ng/ml)

The average mean values of SOD (ng/ml) for all sixteen Barbari bucks on individual as well as overall basis are depicted in Table 1. 3.95 ± 0.32 (ng/ml) testosterone in Control bucks and 4.47 ± 0.28 (ng/ml) testosterone in Group1 bucks and 4.57 ± 0.29 (ng/ml) testosterone in Group 2 bucks respectively.

The results obtained in present study are similar to those obtained by Sejian et al. (2013)

Table 1: Mean $\pm$ SE of Testosterone of Barbari bucks

Collections	Control	Group 1	Group 2
1	3.57 ± 0.18	4.25 ± 0.23	4.69 ± 0.22
2	4.38 ± 0.45	4.88 ± 0.37	4.32 ± 0.31
3	a 3.73 ± 0.21	ac 4.48 ± 0.27	c 5.19 ± 0.26
4	4.22 ± 0.47	4.93 ± 0.12	4.10 ± 0.33
5	4.14 ± 0.30	4.04 ± 0.40	4.49 ± 0.32
6	4.06 ± 0.43	3.91 ± 0.30	4.54 ± 0.27
7	3.67 ± 0.30	4.69 ± 0.39	4.60 ± 0.37
8	3.89 ± 0.29	4.62 ± 0.19	4.64 ± 0.25

2. Serum Cortisol (n mol/ml)

The average mean values of Cortisol (n mol/ml) for all sixteen Barbari bucks on individual as well as overall basis are depicted in Table 2 60.36 ± 2.01 (n mol/ml) Cortisol in Control bucks and 60.00 ± 1.72 (n mol/ml) Cortisol in Group1 bucks and 62.39 ± 1.49 (n mol/ml) Cortisol in Group 2 bucks respectively.

The results obtained in present study are similar to those obtained by Sejian et al. (2013).

Table: 2: Mean $\pm$ SE of Cortisol of Barbari bucks

Collections	Control	Group 1	Group 2
1	58.40 $\pm$ 1.23	60.48 $\pm$ 2.37	61.67 $\pm$ 1.15
2	58.05 $\pm$ 1.82	59.44 $\pm$ 2.33	61.26 $\pm$ 1.16
3	62.47 $\pm$ 2.99	59.63 $\pm$ 1.50	60.38 $\pm$ 1.36
4	61.26 $\pm$ 1.84	61.43 $\pm$ 1.89	61.66 $\pm$ 2.19
5	60.08 $\pm$ 2.78	58.96 $\pm$ 2.16	64.62 $\pm$ 1.50
6	60.45 $\pm$ 2.44	60.85 $\pm$ 0.70	63.35 $\pm$ 1.27
7	59.28 $\pm$ 1.39	59.15 $\pm$ 1.34	62.86 $\pm$ 1.73
8	62.94 $\pm$ 1.62	60.10 $\pm$ 1.53	63.32 $\pm$ 1.57

Conclusion

A statistically significant difference is noted in the Testosterone level and Cortisol level between area specific mineral mixture and antioxidants supplement group than the control group.

Concentration of Testosterone in blood serum of Barbari buck was found in overall mean value of Control bucks 3.95 $\pm$ 0.32 ng/ml and Group 1 bucks 4.47 $\pm$ 0.28 ng/ml and Group 2 bucks 4.57 $\pm$ 0.29 ng/ml in total 144 samples. Concentration of Cortisol in blood serum of Barbari buck was found in overall mean value of Control bucks 60.36 $\pm$ 2.01 n mol/ml and Group 1 bucks 60.00 $\pm$ 1.72 n mol/ml and Group 2 bucks 62.39 $\pm$ 1.49 n mol/ml in total 144 samples.

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