

## **EFFECT OF AREA SPECIFIC MINERAL MIXTURE AND ANTIOXIDANTS SUPPLEMENTATION ON LIVER FUNCTION TEST 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. Liver function test like Aspartate amino transferase (AST) and Alanine amino transferase (ALT). Two years 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 Aspartate amino transferase (AST) and Alanine amino transferase (ALT) levels differed significantly ( $P < 0.05$ ) between control and treatment groups.

**Keywords:** Barbari bucks, Aspartate amino transferase, Alanine amino transferase.

### **Introduction**

Goats are the first domesticated ruminant animals. They are principally maintained by poorer section of the rural community providing them a source of livelihood. Therefore still the productivity of goats under the prevailing traditional production system is very low. Different breeds of goats produce a variety of products viz. milk, meat, fiber (mohair and pashmina) and manure. These products serve as a secure form of investment, a means of income and are used for various purposes including religious and ceremonial functions. The goat population has increased at a very fast rate making it an important species of animal for meat production. Still there is tremendous potential to be projected it as the 'Future Animal' for rural prosperity under the changing agro-geo-climatic conditions.

The main constraint in any livestock production including goat is the scarcity of good breeding stock, as good breeding stock is important to propagate the particular species. The

achievement of high levels of fertility and prolificacy of goat depends not only upon the female members but also upon males [1]. In order to ensure the optimum reproductive performance of any group of breeding does in which natural service is used, a thorough examination and evaluation of the bucks for breeding soundness is important. The productive and reproductive performance of goat can further be enhanced by selective breeding of does with the bucks exhibiting desirable genetic characteristics [2]. The structural soundness, quality of semen, level of libido and plane of nutrition affect the male reproductive performance [3]. The fertility status of a male individual depends on series of factors which range from animal behavior and physical conditions, to features that are linked directly to the semen such as sperm motility, sperm morphology and biochemical constituents of the seminal plasma [4]. The reproductive performance of an individual animal can be altered through supplementation of micro minerals and antioxidants by nutrition, which can be assessed by semen estimation. Keeping these in a view, the present study was undertaken to assess the effect of area specific mineral mixture and antioxidant supplementation on semen evaluation of some semen 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 ( $32 \pm 2$  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. Aspartate amino transferase (AST) concentration in the blood serum was estimated at 340 nm spectrophotometrically using Span Diagnostic kit and expressed in mg/dl. Alanine amino transferase (ALT) Activity of Serum ALT was estimated at 570 nm spectrophotometrically following the method of g commercial kit (Span Diagnostics Ltd, Surat, India) and the values were expressed as U/L of Serum.

## Results and Discussion

### 1. Aspartate amino Transferase (AST) (IU/dl)

The average mean values of AST (IU/dl) for all sixteen Barbari bucks on individual as well as overall basis are depicted in Table 1.1

79.44±2.97 (IU/dl) AST in Control bucks and 79.97±3.13 (IU/dl) AST in Group1 bucks and 78.53±3.05 (IU/dl) AST in Group 2 bucks respectively.

Tapan kum das et al. (2012) also reported AST 91.23 ± 1.56 to 135.01 ± 0.07 (mg/dl) which were higher than the present study.

Ranjeet singh godara et al. (2015) also reported AST 112.00 ± 9.19 to 148.33 ±11.55 (mg/dl) which were higher than the present study.

**Table: 1.1:** Mean ± SE of AST of Barbari bucks

| Collections | Control    | Group 1    | Group 2    |
|-------------|------------|------------|------------|
| 1           | 82.27±3.79 | 81.27±2.56 | 79.99±3.18 |
| 2           | 79.63±2.13 | 79.04±2.56 | 76.50±1.37 |
| 3           | 81.04±2.66 | 77.23±2.72 | 77.50±1.67 |
| 4           | 78.22±3.15 | 83.55±3.42 | 80.85±3.07 |
| 5           | 78.98±2.73 | 76.22±4.20 | 80.25±4.37 |
| 6           | 75.94±1.70 | 79.41±4.18 | 76.58±3.86 |
| 7           | 80.83±5.41 | 81.35±2.48 | 75.28±3.90 |
| 8           | 78.62±2.19 | 77.69±2.98 | 81.32±3.05 |

## 2. Alanine amino Transferase (ALT) (U/L)

The average mean values of ALT (U/L) for all sixteen Barbari bucks on individual as well as overall basis are depicted in Table 2.1 .

28.10±1.45 (U/L) ALT in Control bucks and 28.13±1.63 (U/L) ALT in Group1 bucks and 27.86±1.53 (U/L) ALT in Group 2 bucks respectively.

Tapan kum das et al. (2012) also reported ALT 12.33 ± 2.74 to 43.36 ± 6.64 (U/L) which were higher than the present study.

Ranjeet singh godara et al. (2015) also reported ALT 10.12 ± 0.30 to 21.61 ± 4.20 (U/L) which were lower than the present study.

**Table: 2.1:** Mean ± SE of ALT of Barbari bucks

| Collections | Control    | Group 1    | Group 2    |
|-------------|------------|------------|------------|
| 1           | 29.97±1.33 | 31.27±1.55 | 29.03±0.94 |
| 2           | 27.19±0.92 | 27.24±2.30 | 27.71±1.76 |
| 3           | 26.68±1.00 | 27.54±0.84 | 26.37±2.42 |
| 4           | 29.67±1.54 | 26.94±1.92 | 26.90±1.46 |
| 5           | 29.07±0.93 | 26.59±2.45 | 27.30±1.42 |
| 6           | 26.06±2.44 | 27.36±1.97 | 27.36±2.19 |
| 7           | 28.53±1.88 | 28.89±1.12 | 27.36±1.21 |
| 8           | 27.70±1.56 | 29.22±0.90 | 30.89±0.89 |

## Conclusion

A statistically significant difference is noted in the Aspartate amino Transferase (AST) level and Alanine amino Transferase (ALT) level between area specific mineral mixture and antioxidants supplement group than the control group.

Concentration of Aspartate amino Transferase in blood serum of Barbari buck was found in overall mean value of AST in blood serum of Barbari buck was found in of Control bucks 79.44±2.97 IU/dl and Group 1 bucks 79.97±3.13 IU/dl and Group 2 bucks 78.53±3.05 IU/dl in total 144 samples.

Overall mean concentrations of ALT in blood serum of Barbari buck was found in of Control bucks 28.10±1.45 U/L and Group 1 bucks 28.13±1.63 U/L and Group 2 bucks 27.86±1.53 U/L in total 144 samples.

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