



STUDIES ON SERUM MINERAL PROFILE OF BLACK BENGAL GOATS IN TWO AGRO-CLIMATIC ZONES OF WEST BENGAL

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ABSTRACT

The study was carried on three hundred seventy six Black Bengal goats in two sub regions of West Bengal. The information pertaining to the present study was collected from two hundred ninety three goat farmers by participatory and rapid rural appraisal techniques in repeated interactions. Considering the effect of sub-region on serum mineral profile irrespective of age group viz. Ca (%), P (%), Mg (%) was 8.38 ± 0.09 & 7.57 ± 0.10 , 4.21 ± 0.08 & 3.66 ± 0.08 , 4.21 ± 0.04 & 3.66 ± 0.05 for GFP (Gangetic Flood Plane) & CFP (Coastal Flood Plane) respectively. Similarly serum Cu, Zn, Fe & Mn concentration was 0.61 ± 0.03 & 0.50 ± 0.02 , 0.93 ± 0.02 & 0.83 ± 0.02 , 2.05 ± 0.08 & 1.81 ± 0.05 and 0.19 ± 0.01 & 0.14 ± 0.01 respectively for GFP & CFP. Serum minerals profile in GFP & CFP sub-regions was different it was higher side in GFP than CFP sub-regions. Again serum minerals concentrations were high at 6 month of age than 3 months age.

KEY WORDS: Black Bengal goat, serum mineral profile, Coastal Flood Plane, Gangetic Flood Plane

INTRODUCTION

Goat rearing is an important occupation and provides livelihood to many arid areas of the country. The goats are known to be especially useful to people in semi-arid zones, where goats can sustain themselves on limited forage and extreme climate where other species food animal generally find difficult to sustain except sheep. Goat rearing is one of the important agricultural enterprises particularly in rural parts of this country and has proved very useful to man throughout the ages, largely because of their adaptability to varying environmental conditions under which the breeds and strain types have evolved and in which they are maintained. Black Bengal goat is mainly a meat type breed and famous for meat, skin quality and high prolificacy. West Bengal ranks 4th (11.51 million) in goat population in India (Livestock census report, 2012) and possesses a valuable genetic resource of dwarf goat called Black Bengal Goat (Synonym Bengal Goat). The goat is a versatile animal and often regarded as wet nurse of infants in Europe. Contrary to cattle and sheep, goats are mainly browsers and would seldom go for grown up trees (Lu, 1988). They dislike the leaves of timber trees. They also do not prevent the establishment and spread of grasses which are so essential for soil conservation. The present study has been undertaken in field condition to analyze and compare the serum minerals profile of goat in two agro-climatic sub-regions of West Bengal

MATERIALS & METHODS

The data pertaining to the serum mineral profile of Black Bengal goats were carried out in two agro-climatic sub-regions viz. Gangetic Flood Plain (GFP) that includes Ayeshpur-Panchpota and Ganguria villages of Nadia district and Coastal Flood Plain (CFP) that includes Jatirampur village of Gosaba in the South-24-Parganas

under Agro-climatic regions of Lower Gangetic Plain Region, Zone-II of West Bengal. The information regarding the present study were collected by participatory approach, investigation and rapid rural appraisal technique from 293 goat owners in respective villages in repeated interactions from January, 2013 to August, 2013.

Serum Ca and Mg were determined as per the method described by Trudeau and Freier (1967) and the results were expressed as mg/dl. Serum phosphorus was estimated by colorimetric method of Fiske, and Subba Row (1925) and the result was expressed as mg/dl. Serum trace minerals (Cu, Zn, Mn and Fe) were determined as per the method described by Fernandez and Kahn (1971) using atomic absorption spectrometer (Perkin Elmer Analyst 100). The results were expressed as ppm (parts per million).

Statistical Analysis

All the data were analyzed multivariate, univariate analysis of variance technique in the generalized linear model (GLM) and also by comparative means of SPSS (Version 21.0).

RESULTS & DISCUSSION

Table 1 and Table 2 show the serum mineral profile of goats at 3 months and 6 months of age and at the same time sub-region wise profile also.

Considering the effect of sub-region on serum mineral profile irrespective of age group viz. Ca (%), P (%), Mg (%) was 8.38 ± 0.09 & 7.57 ± 0.10 , 4.21 ± 0.08 & 3.66 ± 0.08 , 4.21 ± 0.04 & 3.66 ± 0.05 for GFP & CFP respectively. Statistical analysis showed significant ($P < 0.01$) among the two sub-regions. Similarly serum Cu, Zn, Fe & Mn concentration was 0.61 ± 0.03 & 0.50 ± 0.02 , 0.93 ± 0.02 & 0.83 ± 0.02 , 2.05 ± 0.08 & 1.81 ± 0.05 and 0.19 ± 0.01 & 0.14 ± 0.01 respectively for GFP & CFP. There was highly significant effect ($P < 0.01$) on serum mineral due to sub-

region was observed. This may be due to difference in soil characters, feed & fodder variation in relation to the minerals (major & trace) which is turn reflects on. In the same way the effect of age on serum mineral also depicted. From the table 2, it has been observed that Ca, P & Mg concentration in serum at 3 months & 6 months age was 7.75±0.13 & 8.02±0.11, 3.81±0.10 & 4.06±0.09 and 2.48±0.06 & 2.61±0.05 mg/dl respectively. Statistical analysis showed significant (P<0.05) difference in Ca concentration at 3 & 6 months of age but P & Mg did not show any significant difference (P>0.05) at 3 & 6 months of age. Serum Cu, Zn, Fe & Mn level was 0.50±0.02 & 0.62±0.02, 0.83±0.02 & 0.94 ±0.02, 1.89±0.07 & 1.98±0.07 and 0.15±0.01 & 0.19±0.01 at 3 month & 6 month respectively. Except Fe concentration Cu, Zn & Mn values showed highly significant (P<0.01) difference at 3 months and 6 months. The higher value of all serum minerals was observed at 6 months of age. This may be due to slow accumulation of minerals in the body systems which reflect on serum. Ghosh and Dinda (2000) reported

that the mean plasma Ca concentration on goats of different blocks of new alluvial zone of West Bengal was 6.39, 9.67, 9.33 and 8.40 mg/dl respectively. Biswas and Samanta (2002) recorded that the average Ca concentration in plasma of goats in old alluvial zone of West Bengal was 11.74 mg/dl. The data obtained in the present study was in agreement with the study of Ghosh and Dinda (2000). Sarkar *et al.* (1990) found that serum Fe & Cu of anaemic Black Bengal goats were 1.15 to 1.41 and 0.92 to 1.13 ppm respectively in Nadia district of West Bengal. Roy *et al.* (1992) found that plasma Zn level of Black Bengal bucks at the age of 4, 8, 12, 16 and 20 months were 1.53, 1.52, 1.49, 1.48 and 1.50 ppm respectively. Biswas and Samanta (2002) observed that mean Fe, Zn, Cu and Mn concentrations in goats of alluvial zone of West Bengal were found to be 2.42, 1.76, 0.64 and 0.27 ppm respectively. The present studies in connection with the serum trace minerals viz. Fe, Cu & Mn are in close association with the study of Biswas and Samanta (2002).

TABLE 1: Effect of Sub-region on Serum minerals profile of Black Bengal goats in two agro-climatic sub-regions of W.B.

Sub-region	Particulars						
	Ca	P	Mg	Cu	Zn	Fe	Mn
GFP	8.38 ±0.09 (30)	4.21 ±0.08 (30)	4.21 ±0.04 (30)	0.61 ±0.03 (30)	0.93 ±0.02 (30)	2.05 ±0.08 (30)	0.19 ±0.01 (30)
CFP	7.57 ±0.10 (30)	3.66 ±0.08 (30)	3.66 ±0.05 (30)	0.50 ±0.02 (30)	0.83 ±0.02 (30)	1.81 ±0.05 (30)	0.14 ±0.01 (30)
P value	0.000	0.000	0.000	0.001	0.002	0.014	0.000

Figures in parenthesis indicate respective number of observation

TABLE 2: Effect of Age group on Serum minerals profile of Black Bengal goats in two agro-climatic sub-regions of W.B

Age Group	Particulars						
	Ca	P	Mg	Cu	Zn	Fe	Mn
3 Month	7.75 ±0.13 (30)	3.81 ±0.10 (30)	2.48 ±0.06 (30)	0.50 ±0.02 (30)	0.83 ±0.02 (30)	1.89 ±0.07 (30)	0.15 ±0.01 (30)
6 Month	8.02 ±0.11 (30)	4.06 ±0.09 (30)	2.61 ±0.05 (30)	0.62 ±0.02 (30)	0.94 ±0.02 (30)	1.98 ±0.07 (30)	0.19 ±0.01 (30)
P value	0.011	0.058	0.100	0.000	0.000	0.362	0.000

Figures in parenthesis indicate respective number of observation

CONCLUSION

It is clear evident that certain age groups and different agro climatic- zones create differentiation among the animals within the same breed in terms of serum mineral estimation which directly or indirectly suggest the way of economization of goat in West Bengal as the above estimation can create turbulence with the health of animals.

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