

Nematodosis and Chevron Production in Saline Belt of West Bengal (Sunderbans)

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Abstract

Goat rearing plays an important role for subsistence of small, marginal and landless farmers throughout India including West Bengal. In India, parasitic gastroenteritis due to nematode infections has been identified as one of the major constraints for chevon production. In West Bengal 71.87% of the goats suffer from nematode infections predominantly comprising *Haemonchus contortus*, *Oesophagostomum* sp, *Strongyloides papillosus*, *Trichuris* sp and *Trichostrongylus* sp. On this background, a study was conducted in coastal saline belt of Sunderban area at Dulki village under the Gosaba block. Bengal goats (N=20) were randomly selected considering their age, initial body weight, geographical similarity in their origin and place of rearing. The animals were divided into two groups, group-I indicated for treated with anthelmintic drug and group-II indicated for control. The major effects of gastrointestinal (GI) nematodes were found to significantly reduce growth rate resulting in decreased body weight at the end of month 12 of age of infected goats from 11.64 ± 0.008 (gr-II) as compared to treated goats, 13.07 ± 0.007 (gr-I). After the end of the study period (8 months) the treated animals were slaughtered for meat quality and slaughter parameter including dressed weight, dressing percentage, weight of blood, fat percentage. Control group (gr-II) significantly reduced dressed weight and dressing percentage (5.44 ± 0.01 , 49.45 ± 0.01) as compared to treated group (gr-I) 6.35 ± 0.01 , 50.66 ± 0.01 . The economic losses due to gastrointestinal nematodosis in Bengal goats could be reduced if suitable measures are adopted during the proper time.

Key words : Gastrointestinal (GI) nematodes, Chevron, Sunderbans.

The Sunderbans is the largest deltaic region of the world and is thickly populated with diversified microflora and fauna within the enchanting beauty of mangrove. Majority (70%) of rural people of Sunderban depends on livestock based production system, as this is an alternative economic enterprise for the rural mass. It is becoming more relevant as the agricultural production has its own limitation and reached a stagnation point in the saline belt, which is mostly a monocrop. Besides, the per capita availability of cultivable land is seriously dwindling. In this context, the livestock sector, especially goat farming is one of the most important areas to tress upon for sustenance of the rural people for livelihood. The goat meat (chevon) is the most preferred unprejudiced meat in India and is having a steady consumer preference and market. This is becoming more relevant in the present context of the disasters in the name of unprecedented out break of avian flu in certain parts of West Bengal. But there are some impedi-

ments of chevon production. One of these and the most important one is the poor growth rate and low productivity due to infestation of gastrointestinal nematodes causing gastroenteritis, weight loss, retardation in growth, low productivity and increased susceptibility to other diseases resulting into tremendous economic loss every year (1). With this background the present work was planned to find out the prevalence and importance of common GI nematodes infestation on chevon production, its quality and economics at coastal saline belt of West Bengal, to make the goat farming more remunerative to the raisers.

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Table 1. Mean effects of deworming on body weight gain of Bengal goats. Superscripts (a and b) denote that a significant difference appeared between groups and Superscripts (x, y, z, s, h and k) denote that a significant difference appeared between months. Gr-I = Treated with anthelmintics at months 4 and 9. Gr-II = Control (untreated).

Performance	Month	Group		Level of significance (P value)
		Gr-I	Gr-II	
Body weight (kg)	3	4.76 ± 0.009 ^x	4.80 ± 0.009 ^x	0.920
	6	6.36 ± 0.009 ^{xy}	6.16 ± 0.01 ^{by}	<.001
	8	8.86 ± 0.01 ^{yz}	7.26 ± 0.01 ^{bz}	<.001
	10	10.65 ± 0.009 ^{as}	9.05 ± 0.01 ^{bs}	<.001
	11	11.56 ± 0.01 ^{ah}	10.65 ± 0.01 ^{bh}	<.001
	12	13.07 ± 0.007 ^{ak}	11.64 ± 0.008 ^{bk}	<.001
Level of significance (P value)		<.001	<.001	<.001
Body weight gain (BWG)	Total gain (kg)	8.37 ± 0.009 ^a	6.56 ± 0.01 ^b	<.001
Ante mortem wt (kg)	ADG (g/day)	34.46 ± 0.01 ^a	27.46 ± 0.01 ^b	<.001
Shrinkage (%)	12	12.56 ± 0.01 ^a	11.04 ± 0.01 ^b	<.001
	24h	4.46 ± 0.01 ^a	5.04 ± 0.01 ^b	<.001

Methods

The study was conducted at the coastal saline belt of Sunderban area at Dulki village. Initially, a survey was done on 100 families rearing livestock who were served with questionnaires to sort out the exact problem along with the existing status of livestock farming, particularly the goat rearing in that area. The survey also highlighted the lack of productivity proportionately with the time and suffering of the animals for parasitism. To find out the appropriate solution of these problems this experimen-

tal work was designed.

For this study, 20 animals in each group were selected among 100 surveyed animals considering their age, initial body weight, species and geographical similarity of their origin and place of rearing. These animals were identified by neck tag individually. The fecal samples were collected and examined by Modified Mc. Master's technique (2) for parasitic load. The physiological status of the experimental animals was also noted. To study the growth rate of Black Bengal goat in the experimental area, body weight of individual animal, belonging two groups were measured

Table 2. Mean different slaughter parameters in different groups of Bengal goats. Superscripts (a and b) denote a significant difference appeared in between groups.

Slaughter parameter		Group		Level of significance (P value)
		Gr-I	Gr-II	
Dressed carcass	Dressed wt (kg)	6.35 ± 0.01 ^a	5.44 ± 0.01 ^b	<.001
	Dressing percentage (%)	50.66 ± 0.01 ^a	49.45 ± 0.01 ^b	<.001
Blood	Total weight of blood (g)	469.56 ± 0.01 ^a	394.64 ± 0.12 ^b	<.001
	Bleeding percentage (%)	3.65 ± 0.01 ^a	3.52 ± 0.01 ^b	<.001
Skin	Total wt of skin (g)	849.56 ± 0.10 ^a	719.50 ± 0.10 ^b	<.001
Head	Wt of head (g)	969.04 ± 0.22 ^a	859.08 ± 0.22 ^b	<.001
Edible organ	Liver (g)	199.52 ± 0.10 ^a	198.88 ± 0.28 ^b	<.001
	Heart (g)	34.28 ± 0.27 ^a	28.78 ± 0.25 ^b	<.001
	Kidney (g)	44.02 ± 0.31 ^a	34.50 ± 0.15 ^b	<.001
Inedible organ	Stomach, intestine, esophagus, trachea (g)	1382.00 ± 14.71 ^a	1112.00 ± 13.92 ^b	<.001
Fat	Wt of fat (g)	149.20 ± 0.20 ^a	124.32 ± 0.24 ^b	<.001
	Fat percentage (%)	2.26 ± 0.008 ^a	2.12 ± 0.01 ^b	<.001

Table 3. Mean physico-chemical characteristics and sensory evaluation (tenderness) in two groups of Bengal goats. Super-scripts (a and b) denote a significant difference appeared in between groups.

Physico-chemical parameters	Measure-ments Month	Group		Level of significance (<i>P</i> value)
		Gr-I	Gr-II	
pH (24 h)	12	5.86 ± 0.01 ^a	5.89 ± 0.01 ^b	< .001
pH (48 h)	12	5.75 ± 0.008 ^a	5.76 ± 0.01 ^b	< .001
WHC (sq cm) 24 h	12	50.55 ± 0.01 ^a	54.16 ± 0.01 ^b	< .001
WHC (sq cm) 48 h	12	51.27 ± 0.01 ^a	56.17 ± 0.007 ^b	< .001
Fiber diameter (µm) 24 h	12	44.97 ± 0.02 ^a	40.07 ± 0.02 ^b	< .001
Fiber diameter (µm) 48 h	12	44.46 ± 0.01 ^a	39.70 ± 0.02 ^b	< .001
Sensory evaluation (tenderness) 24 h	12	3.99 ± 0.01 ^a	3.52 ± 0.02 ^b	< .001
Sensory evaluation (tenderness) 48 h	12	3.80 ± 0.01 ^a	3.50 ± 0.01 ^b	< .001

with the help of spring balance. Body weights of all goats were recorded from the day of first anthelmintic treatment at monthly interval up to the termination of the study.

For anthelmintic treatment of the animals under the groups (gr-I) were made free from gastrointestinal parasites infection by treating with fenbendazole and praziquental (tab. Fentus Plus 150 mg) at 7.5 mg/kg body wt orally at month 4 and 9 of age. Data obtained were analyzed as per standard statistical technique (3).

Results and Discussion

The mean effects of deworming on body weight gain of Bengal goats are given in Tables 1 to 3. Concerning different slaughter parameters, the body weight at different age groups of the animals, the highest body weight has been recorded in gr-I animals, i.e. 13.07 ± 0.007 at 12 months of age whereas in the corresponding figure in gr-II is 11.64 ± 0.008 . The highest body weight gain was also recorded in treated group (gr-I) animals i.e. 8.37 ± 0.009 whereas, the lowest body weight gain was in the control group (gr-II) 6.56 ± 0.01 . Average daily weight gain was highest in the treated group (gr-I) 34.46 ± 0.01 . The lowest body weight gain recorded in the control group was (gr-II) 27.46 ± 0.01 . It was statistically highly significant ($P < 0.01$), while comparing the control group and treated groups.

Such significant increment of the growth in different groups was due to timely application of

anthelmintics. The opinion was postulated by Walkden-Brown (4) and Simpson (5). The role of parasites to interfere with the growth of the animals was the primary factor for such condition of the animals, which actually interfere for malabsorption of feed in the body system (6—8).

Economics

To analyze the cost benefit it has been calculated that deworming cost is about Rs 40.00 per animal whereas enhancement of meat weighing near about 1 kg whose cost will be approximately Rs 180 (at Rs 180/kg).

This study could be helpful to understand that from each goat the extra productivity of chevon and thereby extra income could be possible to a turn of Rs 140/goat for which a little technological know-how of deworming of the goats is required.

Thus the work is important to ensure the increase in income for the goat raisers in rural working people and it also contributes to the food and nutritional security by producing more chevon in the state.

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