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Short Communication

ASSESSMENT OF ECONOMIC LOSS DUE TO GASTROINTESTINAL NEMATODE (GIN) INFECTION IN GOAT OF JABALPUR DISTRICT, MADHYA PRADESH

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SUMMARY

Gastrointestinal nematode (GIN) infection is prevalent throughout the world, including India and is one of the important causes for poor performance in goats. The goal of the current study was to evaluate the financial burden caused by GIN infection in goats at Ghana village of Jabalpur district, Madhya Pradesh. A total of 60 kids approximately 3-4 months of age were screened for GIN infections by qualitative faecal examination method. Faecal samples positive for strongyle infections were subjected to modified McMaster technique. Twenty goats with ≥ 300 EPG were selected for this study. Two groups of ten goats each were randomly selected, and one group received treatment with an appropriate anthelmintic medication (fenbendazole @7.5 mg/kg body weight), while the other group was left as an untreated control group. At 9 months, the infected groups had the greatest faecal egg count (1233.33) with a mean EPG of 629.68. Body weight decreased significantly (P<0.05) in untreated control group as compared to the treated group with an estimated loss of 3.385 kg body weight along with monetary loss of Rs. 744.70 per goat per year. The present studied shows that, GIN infections can cause a significant reduction in weight, leading to economic loss in goats rearing.

Keywords: Economic loss, Gastrointestinal nematodes, Goat, Madhya Pradesh

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In the rural Indian economy, small ruminants like goats are important since they make up a large portion of marginal farmers and labourers without land (Singh *et al.*, 2015). Numerous helminthic parasites cause significant losses in afflicted goats because of illness, mortality, and decreased productivity. Goats are susceptible to a number of parasitic infections that not only compromise their general health but also significantly reduce their total output (Sanyal, 1996; Jas *et al.*, 2007); gastrointestinal parasitism (GIPs) is a major cause of this kind of ailment in India. Gastrointestinal nematodes cause poor performance in infected goats (Knox and Steel, 1996; Dhamdar, 2020). The gastrointestinal parasites cause anaemia, emaciation, oedema, weakness, diarrhoea and death in case of untreated infected animals (Lutu, 1983). Jas *et al.*, 2007 reported economic losses in small ruminants in India. The goal of the current study was to calculate the economic loss resulting from GIN infections in goats by calculating the conversion of body weight gain losses into monetary loss per goat.

The present investigation was organized on a local goat breed, naturally infected with GINs at Ghana village of Jabalpur district, Madhya Pradesh (M.P.). The current study was carried out over a 12-month period, starting in January and ending in December of 2012. The selected animals were kept in a semi-intensive management regime with irregular deworming procedures. A total of 60 young goats of either sex were screened coprologically for the presence of GIN parasites by qualitative faecal examination method and positive samples of strongyle infection were subsequently examined by modified McMaster technique (Mines, 1977). Twenty goats approximately 3-4 months old with faecal egg counts of >300 were selected for whole study period and divided randomly into two different groups; ten animals in each. These selected animals were identified individually by using proper tags and their body weight gains recorded at monthly interval. The goats of one group (n=10) were treated with fenbendazole @ 7.5 mg/kg body weight once at the start of the study after faecal examination, when the faecal egg counts were observed as >100 and the other kept as untreated control group. Both the groups were allowed to graze during day time in groups and fed the traditional hay and fodder by the farmers during night. Furthermore, the efficacy of the fenbendazole was checked by faecal egg count reduction test (FECRT) at the monthly interval. The body weight increases of both groups were noted at the time of faecal samples in order to evaluate the impact of GIN infection on goat chevon production. The Statistical Package for the Social Sciences (SPSS), Version 14.0, was used to compare the body weight gains of the two groups and analyse the data. At the 5% (p<0.05) level, the significance of the p value was recorded.

The losses brought on by helminth parasite infections are catastrophic, and they are typically asymptomatic and

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Table 1. Particulars of monthly body weights (kg) of goats in treated and untreated groups.

Month (post-treatment)	Body weights (kg)			
	Treated group (n=10) (Body weight)	EPG	Untreated group (n=10) (Body weight)	EPG
0	7.70±0.63	342.23	7.50±0.56	415.38
1st	8.60±0.60	371.43	8.10±0.56	469.23
2nd	9.35±0.57	344.44	8.70±0.57	438.46
3rd	10.60±0.51	437.50	9.70±0.52*	484.62
4th	11.70±0.48	366.67	10.60±0.50*	446.15
5th	12.92±0.44	387.50	11.40±0.49*	530.77
6th	14.14±0.41	437.50	12.25±0.52*	569.23
7th	15.27±0.42	711.11	13.25±0.57*	723.08
8th	16.16±0.43	944.44	14.15±0.61*	1330.77
9th	17.41±0.43	1233.33	14.95±0.64*	1092.31
10th	18.71±0.45	1022.22	15.65±0.65*	853.85
11th	19.84±0.47	777.78	16.54±0.68*	569.23
12th	20.96±0.45	522.22	17.38±0.68*	660.26
Difference in weight gain	13.265±0.24		9.88±0.29*	
Loss in body weight (kg)			3.385	
Loss in chevon production (kg)			1.693	
Loss due to weight @ Rs. 440/- per kg			Rs. 744.92	

Values expressed as Mean ± SE; Values with different superscripts differ significantly (rows) ($p<0.05$)

persistent in character. Monthly egg per gram (EPG) counts of nematodes were measured in all infected goats, and the resultant faecal egg count was utilized as a gauge for the severity of GIN infections. The highest EPG was recorded during 9th month (1233.33) with a mean EPG of 629.68 in the treated group. The estimation of impact of naturally occurring GIN infections in goats were determined by compared to body weight gains of both groups i.e. treated and untreated. The ultimate loss in body weight of infected goats might be due to presence of GI nematodes and in term of considered as production loss i.e., chevon. An average pricing of Rs. 440/-per kilogram of chevon in Jabalpur, Madhya Pradesh, was used to convert the final loss in chevon production into Indian rupees (INR) (Table 1). When compared to the recorded weight prior to treatment, the body weight gains of the treated goats showed a substantial increase ($P<0.05$).

When the body weight gains of the treated and untreated goat groups were compared, it was found that the treated goats had greater body weight growth ($P<0.05$) than the untreated goats. In the end, the goats in the treated and untreated groups gained an average of 13.265 kg and 9.880 kg, respectively; the mean losses in body weight growth were 3.385 kg (Table 1). The mean loss of chevon production in goats was 1.693 kg, with considering 50% as the dressing percentage in goats. Therefore, economic losses in chevon production were calculated Rs. 744.92 (Rs. 440 × 1.693 kg), considering the average local market rate of chevon as Rs. 440/-. Although there is little research on the financial damages GIN parasites bring to goats in India, there is some indication that they are to blame for these productivity losses (Jas and Ghosh, 2009; Murhaban *et al.*, 2017).

According to the current study, untreated goats' body weight gain is significantly ($P<0.05$) lower than that of the treated group when they have GIN infections. Since the young goats were chosen for the current study, the decrease in the body weight gain of untreated goats suggests that GIN infections have a detrimental effect on growth rate. The current study's findings about the reductions in body weight gains brought on by GIN parasites were consistent with previous findings (Githigia *et al.*, 2001; Jas *et al.*, 2007). Worm load causes the growth rate of infected animals to decrease, and even a subclinical infection can cause the body weight increase to decrease (Soulsby, 1965). Even though the current study's mean EPG was 629.68, the untreated group's decreased body weight increase was still noticeable and in good agreement with previous findings by Ilangopathy *et al.* (2019). Reduced feed intake and low feed conversion efficiency brought on by nematode infection may be the cause of the untreated group's decreased body weight gain. Reduced body weight gain in the untreated group is thought to be caused by a variety of factors, including abdominal pain,

changes in pH, inflammation in the gut, changes in the flow rate of digesta, changes in the protein to energy ratio of absorbed nutrients, and the secretion of the hormone cholecystokinin (Martin *et al.*, 1996). The exact mechanism underlying this reduced feed intake is unclear. It is estimated that reduced feed utilization contributes about 25g of body weight per day, and this could be another reason for the untreated group's lower body weight growth (Soulsby, 1976). In addition to lowering feed intake, GIN infections cause a decrease in feed conversion efficiency, which increases protein catabolism and impairs protein digestion (Soulsby, 1976). In conclusion, GIN infections result in a large financial loss for goats raised for meat. Using the right anthelmintic to manage mental techniques for GI parasite infection control will increase goat farming output.

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