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Anthelmintic Resistance in Gastro-intestinal Nematodes of Goat with reference to Feeding and Grazing Practices in Patna District of Bihar

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ABSTRACT

The anthelmintic resistance (AR) in naturally infected goats (12-24 months of age group) with GI nematode parasites was studied. In this study 100 goat keepers were selected and their views were recorded through semi-structured interview scheduled on grazing and feeding practices to assess the need of control measures. For present study the variables like Feeding green fodder, feeding concentrate regularly, Method of feeding concentrate, feeding additional concentrate during pregnancy, grazing practices regularly, use of common salt in feed, use of mineral mixture regularly was taken under consideration. The 50 rural and 50 urban goat farmers were taken for the present study. It was found that all the goat keepers were using green fodder for their goats in rural area where as only 8% goat keepers of urban area provided the green fodder to their animals. This was probably due to the lack of open land and pasture areas to graze their goats in urban area. Contrary to this goat keepers of urban area provides balance concentrate ration (72%) and pulses straw (96%) to their goats whereas 16 % and 84 % of rural goat keepers provide concentrate and pulses straw respectively to their animals.

Keywords: Anthelmintic Resistance (AR), GI nematode, mineral mixture and Grazing and Feeding pattern

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INTRODUCTION

If agriculture is the mainstay of Indian economy, animal husbandry constitutes the sheet anchor of Indian agriculture system. Around 73% of rural masses look towards livestock as a source of livelihood. Recently, as per the report of 19th Livestock Census, goats constitute 26.40% of the total livestock population. The goat meat production has doubled (9.3% to 18.3%) and goat milk production has shown a growth rate of 31.53% during the last decade. The goat sector and its products alone contribute 8.5% to Indian livestock GDP. In last few years it is a rapidly growing industry in India (Dash, 2017) providing glimpse of future hope for young entrepreneurs to develop knowledge and skill in this species. For landless, marginal farmers and downtrodden peasants, the tiny ruminants are the indicator of life. In Indian condition, understanding of anthelmintic resistance is still meager (Singh *et al.*, 2002). The information on the occurrence of the anthelmintic resistance has been limited to organized farms but now reports from a number of field flocks suggested that the extent of anthelmintic resistance has been underestimated in India (Singh *et al.*, 2002). In context of Bihar. Very few sporadic studies have been carried out pertaining to anthelmintic resistance in small ruminants, but studies of anthelmintic resistance on goats are lacking. Thus, an immediate attention towards a serious and major field problem of anthelmintic resistance in goats in Bihar, is need of hour to assess the status of the anthelmintic resistance in order to facilitate formulation of a suitable module for worm management programme in goats.

MATERIAL AND METHODS

As per data of questionnaire survey it was observed that the gastro-intestinal nematodosis greatly influenced by grazing and feeding pattern followed by the goat keepers. Pastureland for free ranged and semi-intensive system of animal rearing, plays an important role for increasing the frequency of incidence. The incidence of gastro-intestinal nematodosis and pattern of disease outbreak closely related with the repeated grazing in common pasture and become the major source of infection for grazing goat flocks. Probability of reinfection by parasites in this pattern increased in many folds. Frequent contacts between parasites and host often change in the parasite's ecological behavior for its survival. In this way, repeated grazing in same pasture, faecal output further increases the chances of infection. In Bihar, the condition of either free grazing or semi-intensive goat farming is mostly carried out by poor landless and illiterate farmer. They hardly provide proper nourishment or anthelmintic schedule to their flocks and never apply any hygiene management, thus

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directly responsible for high degree of parasitism in goat flocks. The questionnaire was prepared as detailed below with allotment of numerical categories and based on which, factors are significantly associated with control strategies were discussed.

RESULTS AND DISCUSSION

The present study, guidelines were formulating for farmers for control of anthelmintic resistance of GI parasitism in goats. In this context, initially the awareness and other information's on the grazing and feeding practices followed by urban and rural goat keepers of Patna district was recorded through questionnaire survey. It was found that all the goat keepers were using green fodder for their goats in rural area where as only 8% goat keepers of urban area used the green fodder for their animals (Table 1). This was probably due to the lack of open land and pasture areas to graze their goats in urban area. This was also might be due to lack of manpower and time to graze the goats in urban lifestyle. Contrary to this goat keepers of urban area provides balance concentrate ration (72%) and pulses straw (96%) to their goats whereas 16 % and 84 % of rural goat keepers provide concentrate and pulses straw respectively to their animals.

Further, it was found in the study that mineral mixture and common salt was not used by almost all the respondents of rural as well as urban area. This was due to the fact that they are not aware or less knowledge about the use and importance of the common salt and mineral mixture as it was also found by the researcher during their interaction to respondents while data collection.

Similar to findings of present investigations, Khan *et al.,* (1996) noticed almost 100% of grazing goats harbored light to medium levels of parasitic infection. Similar finding was also reported by Dhiman *et al.,* (1990) and Radotra *et al.,* (1996) in agro-climatic conditions. Alam *et al.,* (2003) suggested that prevalence of gastro- intestinal nematodiosis increases by continuous grazing in same field and control of parasites can be done by proper grazing management. Arora *et al.,* (2003) reported that under semi-intensive pattern of goats farming nematodiosis was more prevalent. La *et al.,* (2003) studied grazing area considerably influenced the gastro-intestinal nematodosis in goats. Singh *et al.,* (2004) revealed that chaffing of fodder was uncommon or absent and concentrate provided to productive animals only in Tarikhet block of Kumaon hills of Uttarakhand. In Rajnandgaon city of Chhattisgarh, Deoras *et al.,* (2004) observed that most of the livestock farmers of both rural (100%) and urban (3%) sent their animals out for grazing. Majority of the rural farmers did not provide balanced ration to their animals. Whereas, significantly higher number of urban farmers provided it to their animals. They also observed that higher cost of concentrate was the reason for not giving it to animals. Garg *et al.,* (2005) revealed in Baran district of Rajasthan that large number of households fed their animals in group without any tying facilities. Feeding was done once (95%) daily in the evening. Above findings are also in accordance with the reports of Kumar *et al.,* (2006) who also noted higher prevalence in free grazing migratory sheep. Meena *et. al.,* (2007) reported that there was a common practice in the area that they used to give concentrate only to those animals that were in the milking stage. It was further found that around 51.39 % respondents chaffed the longest over and provided top feeds leaf of Peepal (*Ficus religiosa*), Neem (*Azadirachta indica*) and Jharbarry (*Ziziphus nummularia*) as these were available in that area. Use of mineral mixture and salt for feeding was not common practice as only some of animal keepers (13.93%) were giving it on regular basis. Similarly, majority of the respondents did not adopt the practice of treatment of dry fodder with urea molasses to improve its nutritive value. This was due to lack of adequate knowledge regarding this aspect. In Indo Genetic plain of India Thorpe *et al.* (2007) reported problem of insufficient fodder and its nutritive value. Bidwe *et. al.* (2009) revealed

Table 1: Grazing and Feeding pattern followed by the respondents in Patna

Sl. no.	Categories	Rural Goat Keepers (N=50)				Urban Goat Keepers (N=50)			
		Yes		No		Yes		No	
1.	Feeding green fodder	50	(100)	00	(00)	05	(08)	46	(92)
2.	Feeding concentratere regularly	08	(16)	42	(84)	36	(72)	14	(28)
3.	Method of feeding Concentrate:								
	(a) Mixed with fodder	11	(22)	39	(78)	43	(86)	07	(14)
	(b) Separately	39	(78)	11	(22)	07	(14)	43	(86)
4.	Do you feed AdditionalConcentrate during Pregnancy	01	(02)	49	(98)	23	(46)	27	(54)
5.	Most used Dry fodder:								
	(a)Pulses straw	42	(84)	--		48	(96)	--	
	(b)Wheat straw	02	(04)	--		00	(00)	--	
	(c)Paddy straw	06	(12)	--		02	(04)	--	
6.	Grazing practice regularlyfollowed.	50	(100)	00	(00)	03	(06)	47	(94)
7.	Use of common salt in feed	01	(02)	49	(98)	02	(04)	48	(96)
8.	Regular use of mineral mixture	00	(00)	50	(100)	00	(00)	50	(100)

among the various management practices, feeding management appear to have a direct impact on the productivity of animals, which was satisfactory in all herd size groups. A survey through questionnaire conducted by Babu and Rao (2013) in four mandals of Chittoor district to find out the feeding practices adopted by the livestock farmers. Information was extracted from 100 livestock farmers. It was observed that 36-48% of the respondent's famers were feeding paddy straw and 12- 32% were feeding sugarcane tops and leaves along with paddy straw and groundnut haulms. 40-52% were feeding premixed feed and 48-60% feed ingredients. Further, 53- 60% was feeding 3 kg or less and 40-47% % more than 3 kg/ day / animal. 48-60% of the farmers were feeding grains in combination with other ingredients mostly rice bran and ground cake. 62-75% of the respondents were feeding 3 kg and 25-38% more than 3kg. All the farmers (100%) were feeding green fodder to their animals 80-92% of the respondents were feeding up to 20 kg/ day/ animals. Gupta *et. al.* (2014) reported rice straw was found most common dry roughage in all states except Bihar and eastern U. P where wheat straw is preferred. Grazing is practiced in almost all states by the resource poor farmers. In Chhattisgarh 100% surveyed households practiced grazing of animals due to abundant availability of common property resources and nearby forest area. As a result, farmers did not cultivate green fodder. In other states more than 605 households practiced grazing except Bihar and Eastern U.P where rice-wheat crop residues are more in use. In Bihar, the condition of either free grazing or semi-intensive goat farming is mostly carried out by poor landless and illiterate farmer. They hardly provide proper nourishment or anthelmintic schedule to their flocks and never apply any hygiene management, thus directly responsible for high degree of parasitism in goat flocks.

CONCLUSION

In the present study it was observed that knowledge level towards goat farming has direct bearing with occurrence of GI parasitism, because educated goat keepers have followed the technical advice in regard to rearing, feeding and grazing pattern. On the basis of present study and earlier investigation reports, it can be suggested that grazing and feeding practices had non-significant influence on the prevalence of gastro-intestinal nematodes under free ranged and semi-intensive system. However higher prevalence accounted in free ranged goat flocks. Incidence of parasitism and chronicity or acuteness of disease related with common pasture of grazing, water sources, non-practice of anthelmintics, and poor hygiene of stocking places for grazing goat flocks. Stocking density of goat population in semi-intensive management induces chances of contamination for rest healthy goats which might facilitate the higher incidence of parasitism. A wide range of nematodes parasites infection at a single or mixed infection are prevalent in the world-wide population of goats. The problem of goat nematodiosis and pasture contamination is ubiquitous.

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