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Prevalence of Parasitic infestation in Karan Fries, Tharparkar and Murrah Calves Provided with Normal and Treated Effluent Water in Tropics of Haryana

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Abstract

The study was conducted to assess the gastro-intestinal parasitic infestation in group of calves of different breeds of dairy cattle and buffalo. The faecal samples were collected from animals selected for experiment on 0, 7, 14, 21, 28, 35, 42, 56 day interval at National Dairy Research Institute (NDRI), Karnal, Haryana. The selected animals were examined to determine eggs and oocytes per gram of faecal sample to identify the gastro-intestinal parasites in both control and treatment group provided with normal and treated effluent water respectively in an isolated and well managed hygienic environment. On parasitological investigation the group of animals provided with the treated effluent water did not show any threatened value of gastro-intestinal parasites. At normal value some of the parasites observed were Strongyle specis, Trichuris species and Moniezia species. It was also observed that crossbred cattle were more prone to parasitic infection than the indigenous breed of cattle and buffalo.

Keywords: Buffalo, Gastro-Intestinal Parasites, Indigenous and Crossbred Calves, Treated Effluent Water

Introduction

Infestation by the parasites is one among the major constraints which affects profitability of dairy industry in tropics and subtropics of India (Marskole *et al*., 2016). It has affected livestock population irrespective of age, sex, breed and season (Varadharajan *et al*., 2015). It causes inappetite, diarrhea, pot belly, suppression of immune system which in turn may lead to secondary infections (Roy *et al*., 2004; Zhai *et al*., 2014). Moreover Gastrointestinal (G.I.) parasitic infections are profoundly responsible for causing considerable economic losses as infected animal tends to reduce weight gain. This prevalence of parasite is turning out to be a worldwide problem for livestock industry (Saddiqi *et al*., 2010).In India the subclinical gastro-intestinal parasitic infections are most common and economically important (Chowdhury and Tada, 1994). Enormous production losses in adult and higher rate of morbidity and mortality in younger animals is seen in due to prevalence of subclinical infections. In Haryana, studies have been conducted in relation to gastro intestinal parasites, however limited information is available breedwise in an organised dairy farm. Also, the demand for water is increasing with increase in population thereby to mitigate the present water demands and to minimize the wastage of water, the recycling and reuse of water can be an effective solution. In this study the waste water of effluent plant was treated in a cost effective way as a protocol standardized by Ashutosh *et al*, 2018 and it was served to animals for drinking and its effect on prevalence pattern of different gastrointestinal parasites in dairy calves have been documented. This study was conducted in the Livestock Research Centre (LRC) at ICAR-NDRI, Karnal, Haryana.

Material and Methods

The district Karnal is located at 29.68°N latitude and 76.99°E longitudes of Haryana with an elevation of 240 meters above sea level. The research was conducted after taking approval from Institutional Ethical Committee. The study was carried out in healthy calves of Karan Fries (KF), Tharparkar (TP) and Murrah (MH) buffalo (6-8 month old) from May2018 to April 2019. The animals were grouped breed and gender wise. The 6 number of animals were taken in each group (n=6).These groups were further grouped as control and treatment group (n=6). Both the groups were fed as per the feeding and management practices followed in the Livestock Research Centre, while the control group animals were provided with the normal fresh water, the treatment group was given treated effluent water. The faecal samples were collected on 0, 7, 14, 21, 28, 35, 42, 56 day interval irrespective of the season. A total of 576 and 288 faecal samples were collected from control and treatment groups of cattle and buffalo calves respectively and screening was performed for detection of parasitic infections. Faecal samples were collected directly from the rectum of the individual animal and kept in marked plastic pouch/vials. Faecal sample examination was conducted separately and individually for each animal Primary screening was done by preparing direct smears from the faecal samples to search eggs or oocytes of parasites. The eggs were identified and counted on the basis of morphological features described by Soulsby (1982). During examination the faecal samples were observed for *Strongyle, Strongyloides, Amphistome, Trichuris, Fasciola, Moniezia benedeni and Moniezia expansa* spp. Samples found positive were further examined by stoll's dilution method, flotation and sedimentation techniques (Soulsby, 1982) and then quantification was done to estimate the egg per gram (EPG) of faeces by using modified McMaster technique (MAFF, 1986).

Statistical Analysis

Statistical analysis was done as described by Snedecor and Cochran 1994.

Results and Discussion

The results revealed that out of total 576 samples collected from a well maintained herd, in KF calves 37(6.42%), in TP calves 26 (4.51%) and in Murrah calves 32(5.55%) were found positive for eggs of one or more species of GI parasite. Prevalence was observed higher in cattle than buffalo calves, which is in accordance with the findings of Nath *et al*, 2015 who found 42 % prevalence in cattle and 39 % in buffaloes. In between treatment and control group animals the overall 20 (6.94%) samples were found positive in control group and in treatment group the overall prevalence was observed to be 17(5.90%) in KF calves, while in TP calves from control group only 12(4.14%) samples and in treatment group the overall prevalence was found to be 14(4.86%) and in Murrah calves from control group only 17(5.90%) samples were found positive for GI parasites whereas in treatment group the overall prevalence was 15 (5.20%) as depicted in Table 1. Among breeds the KF calves were found to be most infected and the TP calves were least infected irrespective of sex, however the difference was non- significant ($p>0.05$). The

findings suggests that the prevalence of parasitic infestation in all the breeds including cattle and buffalo, control and treatment groups did not showed any significant difference and similarly on studying sex- wise prevalence of parasitic infestation, data depicted in Table 2, the overall prevalence in KF male *was* observed to be 21(7.29%) whereas in female it was found 16(5.55%) similarly in TP male the overall prevalence was observed 14(4.86) whereas in female the overall prevalence was 12(4.16) and in Murrah 19(6.59%) was observed in male whereas in female the overall prevalence was found 14(4.86%). The overall prevalence was slightly higher in male but didn't show any significant difference ($p>0.05$), which is supported by the findings reported by Bilal *et al*.,2009 and Awraris *et al*.,2012.

The overall prevalence in Tharparkar calves *were* lower than the crossbred KF calves which suggested that indigenous breeds are more resistant to parasitic infestation, while prevalence in buffalo calves was recorded slightly higher than the cattle calves. The results obtained were found to be much on lower side as reported by other researchers Laha *et al*.(2013) 28.25%, Rahman *et al*. (2008) 27.48%, Charlier *et al.* (2009) and Pal *et al*. (2008),which may be due to deworming schedule followed before the experiment and the animal were kept at intensive system of housing in good management.

Table 1: Prevalence of parasitic infestation in Karan-Fries, Tharparkar and Murrah calves (Control and Treatment)

Group	Animals	Samples examined	Positive samples (%)	Parasites observed							Mixed infection
				Strongyle spp	*Strongyloides spp*	*Amphistome spp*	*Trichuris spp*	*Fasciola spp*	*Moniezia benedeni*	*Moniezia expansa*	
Karan Fries calves											
Control	12	288	20(6.94)	10(3.47)	2(0.69)	2(0.69)	5(1.73)	-	-	-	1(0.34)
Treatment	12	288	17(5.90)	9(3.12)	1(0.34)	2(0.69)	4(1.38)	-	-	-	1(0.34)
Tharparkar calves											
Control	12	288	12(4.16)	5(1.73)	2(0.69)	1(0.34)	3(1.04)	-	-	-	1(0.34)
Treatment	12	288	14(4.86)	6(2.08)	1(0.34)	1(0.34)	5(1.73)	-	-	-	1(0.34)
Murrah calves											
Control	12	288	17(5.90)	8(2.77)	2(0.69)	-	4(1.38)	-	1(0.34)	-	1(0.34)
Treatment	12	288	15(5.20)	7(2.43)	1(0.34)	1(0.34)	5(1.73)	-	1(0.34)	-	1(0.34)

Table 2: Sex-wise prevalance of parasitic infestation in Karan-Fries, Tharparkar and Murrah calves

Breed (calves)	No. Of Samples Positive		Total No. Of Samples	Percentage Of Prevalence (%)	
	Male	Female	288	Male	Female
Karan Fries	21	16		7.29	5.55
Tharparkar	14	12		4.86	4.16
Murrah	19	14		6.59	4.86

The similar findings were reported by Das *et al*., 2018, Nath *et al*., 2016 and Wadhwa *et al*., 2011. Das *et al*. (2018) and Nath *et al*. (2016) reported that the prevalence of gastrointestinal (GI) parasites in buffaloes is common and relatively high and the prevalence of trematode infection was higher with compared to others gastrointestinal (GI) parasites. Wadhwa *et al*. (2011) on his study observed that the prevalence in cattle varied from 9.09 to 12.50 in different locations and prevalence range was slightly higher in buffaloes which ranged from 10.52 to 14.81.

Also the EPG of the positive faecal samples among different breeds of calves has been depicted in Table 3, which showed that the EPG for all parasites present in faecal samples were within the normal range of 100-200 and samples found positives were mostly post 6 week .The burden of GI parasites was mild which was in accordance with the findings of Marskole *et al*., 2016, in which the EPG was in the range of 201-300 and was considered as moderate infection. The positive samples observed were post 6 weeks which may be due to the reduction in concentration or effect of medicines followed for deworming before starting the experiment.

Table 3: EPG of different GI parasites of Karan-Fries, Tharparkar and Murrah calves

Parasites	Karan-Fries		Tharparkar		Murrah	
	Control	Treatment	Control	Treatment	Control	Treatment
Strongyle spp	200	150	150	100	150	150
Strongyloides	150	100	100	100	100	150
Amphistome spp	100	100	100	50	150	100
Trichuris spp	150	150	100	50	150	50
Fasciola spp	-	-	-	-	-	-
Moniezia benedeni	-	-	-	-	150	150
Moniezia expansa	-	-	-	-	-	-

Conclusion

Based on the observations it can be concluded that the water offered to animals i.e treated and fresh showed no significant effect of the prevalence pattern of the parasites, therefore it can be provided under water scarce areas and under good managemental conditions the parasitic manifestation can be minimized.

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Conflict of Interests

There is no conflict of interest.

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