Gastrointestinal Parasitism in Dairy Cattle in Badulla District: Impact of Age, Feeding Pattern and Water Source

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Introduction

The Gastrointestinal tract of dairy cattle is inhabited by many species of parasites. The prevalence is variable depending upon different intrinsic and extrinsic; epidemiological and biological factors. The economic losses are in the form of mortality, decreased productivity, reduced weight gain and other means affecting the industry globally. Many cattle in Badulla district are underfed during most of the time of the yearand are not supplied with adequate balanced ration. As a result, the general nutritional status of most of the cattle is in subnormal level, which greatly increases susceptibility to parasitic diseases (Blood *et al.*, 1990). This study examines the occurrence of gastrointestinal parasites in dairy cattle in Badulla district and identifies the significance of age, water source and feeding pattern.

Methodology

Two hundred and fifty (n=250) dairy cattle were selected from ten (10) Veterinary Surgeon divisions in Badulla district (Badulla, Passara, Soranathota, Hali-Ela, Welimeda, Bandarawela, Haputale, Mahiyanganaya, Kandeketiya and Meegahakiula). About 10 g of faeces was collected directly from the rectum and transported to the laboratory under refrigeration (4 ^{0}C). Simple Salt flotation technique (Food and Agriculture Organization, 1993) was used to find out the positive samples for gastrointestinal parasites. Briefly, about 3 g of feces was ground with 50 mL of saturated salt solution using mortar and pestle. Solution was strained and kept for 5-10 minutes. A smear was prepared with the sample and parasitic eggs were observed under a light microscope (10X). Positive samples of gastrointestinal parasites were subjected to modified Mc master technique (*Donald, 2007)*to get the EPG/OPG value (Eggs per Gram /Oocysts per Gram). Briefly; about 3 g of faeces was ground with 42 mL of saturated salt solution using mortar and pestle. Sample was examined in a modified Mc master chamber under light microscope (10X) and EPG/OPG values were taken for each category of parasitic eggs. The eggs of gastrointestinal parasites were categorized into six groups, *strongyl*, *strongyloid*, *trichuris*, *ascaris*, *monieza* and *coccidian* oocysts depending on their morphology. Samples having EPG/OPG value more than 1000 were selected and cultured. About 10 g of faeces was taken from positive samples, cultured in pre-sterilized cow dung samples in sterilized empty glass bottles and were covered with a cheese cloth. Water was sprayed daily to the cultured samples. After 14 day time period, the bottles were fully filled with water, covered with Petri dishes and were turned upside down. After 3 hours, a drop was taken from the Petri dishes and kept on a glass slide. A drop of iodine was added to differentiate non parasitic larvae. The morphology of the larvae was examined under the light microscope (40X). The chi-square

test was used to evaluate the associations between prevalence of gastrointestinal parasites, age groups (less than 6 months, 7-12 months, more than 12 months), feeding pattern, water source and using Minitab computer statistical package. Statistical significance was set at $P< 0.05$.

Results and Discussion

Study was consisted with, milking cows (24.4%) and dry cows (4%), heifers (35.6%) and calves (36%) respectively. One hundred and forty three (143) samples were positive for at least one gastro intestinal parasitic species. That is 57.2% from the total sample. 72% of the infected animals were infected with a single species and 28% were mix infected. All the categories of parasitic eggs were commonly found. Average EPG value of the infected animals was 2003 (SD =13859). Maximum value was 150000 and minimum value was zero. Mean EPG value of each parasitic egg type and their maximum values are listed in Table 1. *Trichostrongyl spp* and *Heamonochus spp* were the prominent *Strongyl spp* in cattle in Badulla district.A significant association was observed ($P < 0.05$) between age and presence of *coccidian* oocysts and *trichuris* eggs ($P < 0.05$). The highest prevalence of *eimeria* was with cattle in age group less than 6 months. This suggests the presence of immature immune system in younger calves resulting in more susceptibility to coccidiosis than older cows with immunity from previous exposure, hence more resistant to subsequent reinfections. No significant association was observed between age and presence of *strongyl*, *ascaris*, *moneiza* and *strongyloid* egg types. There is no significance association between feeding pattern and presence of each parasitic egg type ($P <0.05$).

Table 1: Mean and Maximum EPG/OPG values of cattle in Badulla District

Egg type	Mean EPG/OPG	Maximum
Strongyl	179	3900
Ascaris	1205	150000
Eimeria	517	5000
Moneiza	66	5700
Trichuris	17	800
Strongyloids	26	42000

The impact of water source for the presence of *trichuris* eggs is significant ($P < 0.05$). *Trichuris* eggs can survive for 6 months or more in moist soil (William and Lynne, 1991). Eggs are ingested with contaminated water. Wastewater in the form of raw sewage and runoff from dairies and grazing lands has been identified as a likely source of eggs that contaminate drinking water (William and Lynne, 1991). There is no significant association between water source and presence of *strongyl*, *ascaris*, *coccidian*, *moneiza* and *strongyloid* egg types ($P > 0.05$).

Conclusion

All three types of GIT parasites; Nematodes, cestodes and protozoans are common in cattle in Badulla district. Among the nematodes *Strongyl spp* are more prevalent. According to the results of larval culture, *Trichostrongyl spp* and *Haemonchus spp* are the more prevalent strongyls in cattle in Badulla district. Another common nematode present in cattle is *Strongyloid spp*. *Toxocara vitulorum* and *Trichuris spp* are also present in cattle in Badulla district. *Moneiza spp* found to be the most common intestinal cestode present in cattle in Badulla district. *Eimeria spp* is the common protozoans present in cattle in Badulla district.

Associations of age and presence of *coccidian* oocysts and *trichuris* eggs was significant. Yet no significant association was observed between age group and presence of *strongyl*, *ascaris*, *moneiza* and *strongyloid* eggs. Water source plays a significant role for the prevalence of *trichuris* eggs where as feeding pattern has no impact for the prevalence of each parasitic egg types. These findings reveal the threat of GIT parasitism in dairy industry of Badulla district. However, findings may also discuss the public health threat towards the community.

References

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