# Occurrence of Gastrointestinal Parasites from Friesian Cattle in Pekan

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## Abstract

Gastrointestinal parasitic infections in cattle causes a reduction in production and affect the cattle's health. A study was carried out to investigate the parasite infection in cattle from commercial farm in Pekan, Pahang. A total of 152 Friesian cattle and calf samples were collected and examined by direct smear technique, simple flotation, and sedimentation techniques to determine parasite loads in different age groups. Parasitic eggs seen in cattle feces with the highest prevalence was *Eimeria* spp. (56.58%), followed by *Strongyle* spp. (9.87%), *Strongyloides* spp. (1.32%) and *Ascaris* spp. (0.66%). Calves below 6 months (85%) were more infected with parasites than older ones. This study shows that the most common parasite among Friesian cattle was *Eimeria* spp., so an effective farm management system and antiprotozoal treatment should be conducted to control the parasitic infections in cattle farms.

**Keywords:** *Friesian cattle, Gastrointestinal parasites, Pekan*

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## Introduction

Gastrointestinal parasites such as nematodes and trematodes are commonly known to cause severe gastroenteritis in cattle worldwide [1]. These ruminants have been reported to suffer from various diseases such as paramphistomiasis, fascioliasis and many more because of different species of helminth infection [2]. Parasitic infestations are transmitted through the environments contaminated with parasites eggs, oocysts or cysts [3].

Nematode and trematode infection in cattle are very common in Southeast Asia region due to the suitable climate condition year-round for development and spreading of infective stage [4,5,6,7]. The symptoms of helminth infections in cattle are generally anaemia due to haematophagous activities of blood sucking parasites such as *Haemonchus, Mecistocirrus, Bunostomum, Fasciola* and *Paramphistomum* [7,8,9]. In addition, parasites infected cattle were also suffered from diarrhoea because of digestion or absorption disruption effects of nematodes; *Trichostrongylus, Cooperia, Oesophagustomum* and *Paramphistomum*. As result from high burden of parasite attack, cattle experienced chronic weight loss and weakness due to the depression of appetite and reduction of feed digestibility [7,10,11].

In Malaysia, livestock sector carries a major function in agricultural and economy development [12] and the total estimation of cattle population across Malaysia was estimated 752,032 [13]. Livestock production systems practiced in Malaysia are production in rural areas, industrial production of poultry, ducks, pigs and livestock in animal feed. From those production systems in Malaysia, there was no documented finding on the parasitic infection from cattle in Pekan Pahang compared to other studies in several localities in country. Hence, this is the first study to identify the occurrence of gastrointestinal parasites infection from Friesian cattle at different age groups in Pekan, Pahang. The findings of the research hoped to provide information on the prevalence of parasitic infections in cattle and the control measures needed to be implemented by the farmers and authorities.

## Materials and methods

*Study area*

The study was conducted between August until December 2018 in a commercial farm located in Pekan, Pahang. A total of 152 Friesian cattle aged below 6 months until above 1 years were selected randomly in this study. Intensive management system was followed in which in animals were confined and were not let to graze in green pastures. Cattle have not been dewormed were sampled to determine the occurrence of gastrointestinal parasitic infection. Fresh fecal samples were collected directly from the rectum of each cattle. The fecal samples were placed into the stool container, labelled and stored at 4°C.

*Fecal examination*

3 grams of fecal samples was weighed to determine the presence of eggs and helminths using the direct smear technique, sedimentation technique and floatation technique as followed to Soulsby [14]. The present of parasite eggs were microscopically examined under 100x magnification. The individual number of eggs/oocysts per gram of infection were done using McMaster method [15]. The eggs/oocysts found were identified from their morphological characters followed with the description by Soulsby [14] and MAFF [16].

*Data analysis*

All the data were entered into a Microsoft Excel worksheet and all the data analysis was performed using Statistical Package for Social Sciences (SPSS) version 22. The prevalence of gastrointestinal helminths and coccidian were calculated as percentage and recorded. Chi-square test was used to compare the occurrence of infection between age group of cattle.

## Results and Discussion

Out of 152 cattle, a total of 83 cattle (54.6%) were positive for gastrointestinal parasites, with at least one type of parasitic infection (Table 1). Out of 83 infected cattle, 34(83%) were aged below 6 months old followed by 27(54.1%) were aged from 6 months to 1 year old and 22 (39.2%) were aged 1 year old and above, $X^2$ (2, $N$ = 83) = 2.627, p>0.05. Cattle aged below 6 months were more infected with gastrointestinal parasites compared to matured cattle. A total 87 (57.23%) of coccidian oocysts were found from all infective cattle of three level of age, [$X^2$ (2, $N$ = 87) = 4.207, p>0.05] while 16 (10.53%) helminth parasites were detected, [$X^2$ (2, $N$ = 87) = 4.207, p>0.05]. The predominant parasite species infected cattle was coccidian oocysts. Single parasitic infections either with helminths and coccidian were common than mixed infections.

Table 1. Prevalence of gastrointestinal parasites species were found in Friesian cattle from commercial farm in Pekan

| Type of parasites | Prevalence (%) |
|---|---|
| *Eimeria* spp. | 56.5789 |
| *Strongyle* spp. | 9.86842 |
| *Strongyloides* spp. | 1.31578 |
| *Ascaris* spp. | 0.65789 |

The gastrointestinal parasites infected cattle from commercial farm in Pekan were identified as protozoa and nematode comprising from *Eimeria* spp., *Strongyle* spp., *Strongyloides* spp. and *Ascaris* spp. (Table 2). Protozoan parasites, *Eimeria* spp. was the most prevalent parasites found in cattle compared to helminths. The light microscopic images *Eimeria spp.* oocysts were rounded and elongated shape with one or two central clusters of cells called sporonts (Figure 1-4). The sporonts involved in the process of maturing form into sporozoites.

Table 2. Occurrence of gastrointestinal parasites in cattle.

| Age of animals | Examined animals, n | Infected animals, n (%) | Occurrence of gastrointestinal parasites infection in cattle, n (%) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Single helminth | Single coccidia | Mixed infections | Total helminths | Total coccidia |
| Below 6 months | 40 | 34 (85%) | 0 | 30 (75%) | 4 (10%) | 4 (10%) | 34 (85%) |
| 6 months – 1 year | 61 | 27 (44.26%) | 1 (1.64%) | 26 (42.62%) | 6 (9.84%) | 7 (11.75) | 33 (54.10%) |
| 1 year and above | 51 | 22 (43.13) | 3 (5.88) | 18 (35.29%) | 2 (3.92%) | 5 (9.8%) | 20 (39.2%) |
| Total | 152 | 83 (54.60) | 4 (2.63) | 74 (48.68%) | 12 (7.89) | 16 (10.53%) | 87 (57.23%) |
| $X^2$ | | 2.627 | 1 | 3.027 | 2.000 | 0.875 | 4.207 |
| p-value | | >0.05 | >0.05 | >0.05 | >0.05 | >0.05 | >0.05 |

Finding showed that animals aged below than 1 year were more affected with gastrointestinal parasitic infection as compared to animals aged 1 year and above. Recent finding is in agreement with several other studies from different countries [17,18,19]. A study conducted in Tanzania reported the high burden of *Haemonchus* spp., *Cooperia* spp. and *Oesophagostomum* spp. are found infected the immature cattle [17] while in Ethiopia; young ruminants were infected with *Eimeria* spp. and *Strongyle* spp. compared to adult animals [18]. In Sri Lanka, Gunathilaka et al. [19] has reported 17.07% calves (cattle aged below than 12 months) more susceptible to gastrointestinal parasites compared to matured cattle (age more than 12 months) [19]. The causes of variation in occurrence of parasites in different age group might be due to an immune system of the animals and farm management condition. Improper maintenance of intensive farming system such as overcrowded which lead to stress among the young cattle in this study. This observation is consistent with study done by Sharma, [20] that stated parasitic infection is

associated with livestock living space and nutrition. In addition, low immunity level is identified as the factor for young animals are more vulnerable to gastrointestinal parasitic infection [21]. On the contrary, [22,23] stated that the adult animals are more susceptible to parasite infection compared to younger animals. Health status and productivity of cattle will be affected; especially in young cattle if they are infected by these parasite, which then will lead to economic losses [24]. During this study, four different species were detected in the cattle fecal sample such as *Eimeria* spp., *Strongyle* spp., *Strongyloides* spp. and *Ascaris* spp.

A few studies done by Gunathilaka et al. [19], Squire et al. [25] and Sharma and Busang [26] also found the similar parasites as recent finding. Studies by Pam et al. [25] recorded the highest prevalence of *Eimeria* (26.42%) infection in cattle compared to *Strongyloides* while Gunathilaka et al. [19] indicated high parasitic infection for nematode and coccidial oocyst of *Bunostomum*, *Trichuris* and *Eimeria* in cattle. Squire et al. [26] has reported high prevalence of *Strongyles* (63%) followed by *Eimeria* (29.4%) and *Ascaris* (6.1%) from cattle in Southern Ghana. In this study, parasitic eggs and oocysts were detected in cattle could be due to agroclimatic condition and farmhouse management practices which is in consistent ~~to~~ with a finding by Sharma and Busang [27]. High prevalence of protozoan infection in the recent study might be due to farming management system and the climate of the study site. Hot and humid climate condition creates suitable environment for development and transmission of protozoa [28]. For this study, cattle infected with high numbers of coccidian oocysts could be due to the suitable environmental condition in cattle farm enhances the survival and sporulation of oocysts. Meanwhile, the occurrence of helminths is lower compared to other parasites corroborate with a previous study by Huang et al. [29]. The helminth infection rate was lower in this study may be attributed to the restriction in open grazing that was practiced by the farmers which limit the cattle from fed pastures that contaminated with parasitic nematodes. Gunathilaka et al. [19] supported the recent finding that low incidence of gastrointestinal parasites among cattle due to farm management practices and regular antihelminthic treatments.

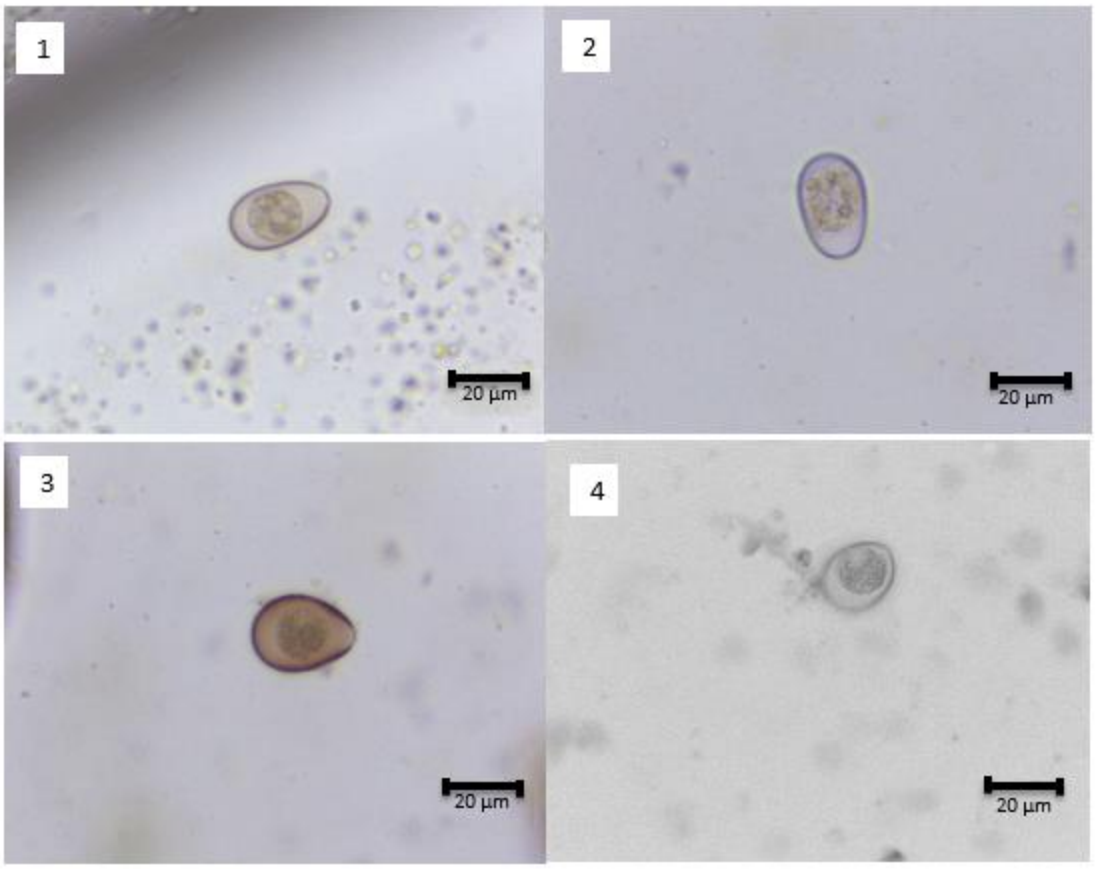


**Figure 1-4.** Figures shown above were the *Eimeria* spp. found in the cattle fecal samples under x400 magnification.

## Conclusion

In conclusion, Friesian cattle were infected with coccidian and helminths infections. The occurrence of gastrointestinal parasites varied with the age of cattle. Good farm management practiced by farmers such as animal husbandry system and pasture management will reduce the parasitic diseases among cattle. The infected cattle with parasites egg need to be treated with antihelminthic drugs in order to prevent the major serious health problems in cattle that lead to mobility and mortality.

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## Author Contributions

Afzan designed the study, conducted the study and prepared the manuscript.

## Disclosure of Conflict of Interest

The author has no conflict of interest

## Compliance with Ethical Standards

This study was approved by IACUC committee, International Islamic University Malaysia and all procedures performed were compliance with the ethical standards of the institutional.

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