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Impact of sex and age on gastrointestinal nematode infections in sheep: Insights from Sugih Mukti Sheep Farm

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ABSTRACT: Gastrointestinal nematodes are pervasive parasites encountered globally, including across all regions of Indonesia, where they significantly impair sheep production by causing weight loss, reducing reproductive performance, and increasing mortality rate. This study assessed the prevalence and intensity of gastrointestinal nematode infections in sheep from the Sugih Mukti Sheep Farm Group in Neglasari Village, Dramaga Sub-District, Bogor Regency, West Java Indonesia. We collected faecal samples from 43 sheep within this group and analysed them for gastrointestinal parasites using the flotation and modified McMaster methods. Our findings revealed the exclusive presence of strongyle eggs, indicative of the order Strongylida, in the faecal samples. The overall prevalence of strongyle infection at the Sugih Mukti farm was 60.5%, with infection rates varying significantly between sexes and age groups: 12.5% in males (n=8), 71.4% in females (n=35), 31.8% in young sheep (n=22), and 90.4% in adult females (n=21). These differences were statistically significant ($P \leq 0.05$). However, the average intensity of strongyle infections was categorised as light, with no significant variation observed with sex or age ($P \geq 0.05$).

Keywords:
sheep, gastrointestinal parasites, strongyle

■ INTRODUCTION

Small ruminants, mainly sheep, hold significant economic and sociocultural value in Indonesia, serving as vital assets for farmers' immediate financial needs and contributing to agricultural sustainability through manure production. Acknowledging their importance, the Indonesian government has actively promoted this sector to enhance animal protein consumption and boost rural economic welfare (Udo & Budisatria 2011).

IPB University has improved sheep breeders' welfare near the Dramaga Campus by forming farming groups and providing extension services. Gastrointestinal nematode (GIN) infections significantly reduce small ruminant productivity; affect meat, milk, and wool production; and can cause death (Nolinda *et al*. 2024). The prevalence of GIN infections on sheep in Wonosobo, Central Java were 51-67% during the dry season (Baihaqi *et al*. 2019). This study assessed the prevalence and intensity of GIN infection among sheep in the Dramaga sub-district, with a focus on variations in sex and age. The goal was to develop management and control strategies to reduce the economic impact on farmers and enhance livestock health.

■ MATERIALS AND METHODS

This study used a cross-sectional design to explore gastrointestinal nematode infections in sheep in the Sugih Mukti sheep farm. Faecal samples from 43 sheep were cooled, transported, and analysed using the flotation and McMaster methods. Flotation qualitatively identified parasite eggs, whereas McMaster quantified eggs per gram of faeces, providing precise infection intensity data. This approach allowed for a detailed assessment of the infection prevalence and intensity, noting differences across sexes and ages in the sheep population.

■ RESULTS AND DISCUSSION

Our meticulous laboratory analyses confirmed the presence of only strongyle eggs, characteristic of the order Strongylida, in sheep faecal samples. These eggs, oval, morulated, and encased in a thin, translucent shell, varied in size from 70 to 150 µm (Roeber *et al*. 2013) (Figure 1).

Figure 1. Nematode strongyle eggs that found at faeces of the sheep from the Sugih Mukti Sheep Farm Group in Neglasari Village, Dramaga Sub-District, Bogor Regency, West Java Indonesia.

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Our thorough comparison of the prevalence of gastrointestinal nematode infections in the Sugih Mukti Sheep Farm Group, which was notably higher (60.5%) than that in a study conducted in the Jember District (24%) (Awaludin *et al*. 2021), provides a comprehensive context for our findings. The warm, wet, and moist tropical climate of Bogor fosters the development of nematode parasites from eggs to the infective L3 stage, unlike Garut, where the brief dry season hampers parasite development. In contrast, consistent rainfall in Bogor supports continuous parasite transmission, as highlighted by Beriajaya (2005). Additionally, the practice of penning sheep and providing cut and carry forage has been identified as a significant factor influencing strongyle infection risks owing to the source of vegetation.

Significant variations in strongyle prevalence were observed between the different sexes and sheep age groups ($P<0.05$) (Table 1). Female sheep displayed a higher prevalence of strongyle infections (71.4 %) than males (12.5 %), which is consistent with the findings of Singh *et al*. (2017), suggesting a higher susceptibility among females, potentially due to hormonal, genetic, and physiological factors. Furthermore, adult sheep exhibited a higher prevalence rate (90.4%) than young sheep (31.8%), likely due to their grazing habits on more extensive, contaminated pastures and increased exposure to various stressors, such as weather, extensive daily movement, and pregnancy. Conversely, young lambs, primarily nourished with milk, faced fewer risks of parasitic infections due to limited grazing activities.

The average intensity of strongyle infections was relatively low, at approximately 190 eggs per gram of faeces, with no significant differences observed between the sexes and age groups. The infection intensity was classified as light (EPG < 500 eggs/gram), moderate (EPG = 500–2000 eggs/gram), or heavy (EPG > 2000 eggs/gram). Most samples fell into the light infection category, with egg counts below 500 EPG, which is consistent with the observations of Kulišić *et al*. (2013). The prevalence of low-to-moderate infections corroborates the findings of the study, while high-intensity infections were notably absent in the results (Table 2). This lower infection intensity may also be attributed to sheep management practices, in which most sheep are housed in barns.

Table 1. The prevalence of strongyle based on sex and age of sheep

Risk Factors	Prevalence n/N; (%)	Chi-square (X^2)	P-value
Sex			
Male	1/8; (12.5)	9.459	0.0021
Female	25/35; (71.4)		
Age			
Young (<12 months)	7/22; (31.8)	15.464	0.0001
Adult (≥12 months)	19/21; (90.4)		

Table 2. The intensity infection of strongyle on sheep

Risk Factor	Strongyle EPG
Sex	
Male	300 ± 0[a]
Female	186 ± 177.52[a]
Age	
Young (<12 months)	117.86± 98.65[a]
Adult (>12 months)	217.11 ± 191.49[a]

Note: EPG=egg per gram

■ CONCLUSION

The prevalence of gastrointestinal strongyle infections among sheep in the Sugih Mukti sheep farm group was 60.5%, with variations influenced by sex and age. The intensity of the strongyle infections generally fell into the light infection category.

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