

Coccidiosis recurrence and treatment efficacy in young Friesian Holstein heifers in Subang, West Java, Indonesia

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ABSTRACT: Coccidiosis significantly affects the health of young heifers aged 8 to 11 months, potentially affecting their Average Daily Gain (ADG) and overall physiological condition. This study aimed to assess the prevalence and management of coccidiosis in caged heifers by monitoring the changes in the occurrence of *Eimeria* spp. oocysts in faecal samples before and after a 14-day treatment regimen. Faecal samples were collected over three weeks, with the initial week marking the emergence of the disease. The treatment was initially effective, but subsequent tests indicated infection recurrence, suggesting barn hygiene issues. These findings underscore the importance of improved sanitation to prevent retransmission of coccidiosis. Further monitoring and repeat testing one-month post-study are recommended to ensure comprehensive management and control of this disease.

Keywords:

average daily gain, coccidiosis, cage management, young heifers

INTRODUCTION

Coccidiosis is a parasitic disease caused by *Eimeria* spp., protozoa from the Eimeriidae family, which infests the digestive tract and specifically invades epithelial cells (Morgoglione *et al.* 2020). Clinical symptoms typically appear between one and two months of age but can occur in animals up to one year old. These symptoms vary widely, depending on the host's health, management practices, and environmental conditions, including the design of housing facilities (Olivares-Muñoz *et al.* 2022).

Transmission usually occurs through the inadvertent ingestion of oocysts shed by infected animals. In farm settings, behaviours such as allogrooming, where young heifers lick each other and their surroundings, can increase the risk of spreading oocysts, especially in indoor housing systems (Tresoldi *et al.* 2015, de Freslon *et al.* 2020;). Poor sanitation exacerbates this issue, allowing *Eimeria* spp. to thrive and be transmitted by vectors, such as flies (Burrell *et al.* 2020). Despite its common occurrence, research on coccidiosis in cattle is limited, thereby revealing a critical gap in veterinary science. This study aimed to delineate the epidemiological patterns of coccidiosis and to improve disease management to boost cattle welfare and farm productivity.

MATERIALS AND METHODS

This study analysed faecal samples from 198 young heifers aged 8–11 months, selected randomly from a total population



Figure 1 Conditions of the barn used for heifer maintenance. (A) Cage sanitation condition, (B) Allogrooming, and (C) Drinking place and water quality in the barn.

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of 489. Samples were collected during five sessions from 21 March to 24 April 2024 with two–five heifers chosen from each pen per session. The heifers underwent a 14-day treatment with Cottimazine®, containing Trimethoprim and Sulfadiazine, during the second session. Faecal oocysts were detected using buoyancy tests. During the final session, the Average Daily Gain (ADG) was measured in seven heifers (representing positive and negative coccidiosis cases). The three-week study included an initial week of onset followed by two weeks of treatment. The chi-square test was used to analyse the relationship between coccidiosis incidence and ADG variations.

■ RESULTS AND DISCUSSION

Table 1 shows that the treatment initially proved effective, as evidenced by the negative results in all samples from the second examination conducted on the seventh day of drug administration. However, subsequent examinations, from the third to the fifth, detected the presence of *Eimeria* sp. oocysts. This recurrence aligns with the findings of Hastutiek et al. (2022), who noted a higher prevalence of coccidiosis in farm environments characterised by poor cage sanitation. Indeed, during our study, the floor cages where faeces began to accumulate were markedly unclean, and the conditions of the watering places were substandard, with visibly cloudy water (Figure 1B). Lassen et al. (2014) emphasize that contaminated soil, which can subsequently pollute water and feed, is a primary transmission route for coccidiosis. Unsanitary cage conditions likely facilitated the persistence and potential retransmission of *Eimeria* sp. oocysts, providing a direct pathway for oocyst entry (Figure 1C).

Regarding animal growth, unsanitary conditions and environmental stressors were identified as significant determinants affecting Average Daily Gain (ADG). These conditions directly affect overall health and the calves' vulnerability to diseases, which can suppress appetite and increase stress, ultimately hindering growth. For instance, despite being housed in the same pen, calves ID 2691 and 2907 exhibited divergent faecal examination results (Table 2) and below-average ADG values of 1.5 - 2 lbs/day or 0.68 - 0.9 kg, as typically expected (Arthington & Moriel 2021). Similar patterns were observed for other samples with higher ADG values. Chi-square analysis (Table 3) revealed no significant correlation between the incidence of coccidiosis and variations in ADG ($p = 0.221$), suggesting that factors other than coccidiosis might influence ADG fluctuations in calves. This finding prompts further investigation of alternative stressors and health issues that could impact growth rates in this context.

Table 1 Results of buoyancy test method on this study

Examination No (Condition)	Score (%)			
	-	+	++	+++
1 (No treatment)	1.25	11.25	2.50	10.00
2 (During treatment)	12.50	0.00	0.00	0.00
3 (After treatment)	20.00	2.50	2.50	0.00
4 (A week after treatment)	28.75	20.00	1.25	0.00
5 (Two week after treatment)	1.25	1.25	5.00	2.50

Table 2 Body size measurements and average daily gain of young heifers in this study

Group	Positive				Negative		
	ID	2717	2360	2907	2795	2583	2691
H (cm)	121	130	116	119	125	117	115
CC (cm)	160	164	146	146	159	149	146
W1 (kg)	28	33	36	21	35	31	36
W2 (kg)	317	331	269	269	313	279	269
ADG (kg/day)	1.06	0.85	0.57	0.88	0.89	0.67	0.89

Note: Height (H), Chest circumference (CC), Initial weight (W1), Final weight (W2)

Table 3 Chi square of average daily gain of young heifers in this study

Coccidiosis	N	%	p-value
	7	100	0.221

Note: Sample Size (N)

■ CONCLUSION

This study indicates that poor sanitation, leading to recurring infections, undermines the effective initial treatment of coccidiosis in heifers. While no direct correlation with Average Daily Gain was found, the findings stress the need for clean environments to ensure cattle health and growth.

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