P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 7; SP-Issue 6; June 2024; Page No. 232-234

Received: 10-04-2024
Accepted: 12-05-2024

Indexed Journal
Peer Reviewed Journal

Floor type affecting gastrointestinal parasite prevalence in equines: A study in Haryana

[1]Pradeep Kumar, [2]Sukhdeep Vohra, [3]Ravi Kumar and [4]Ramkaran

[1]Ph.D., Department of Veterinary Parasitology, LUVAS, Hisar (Haryana), India

[2]Principal Scientist, Department of Veterinary Parasitology, LUVAS, Hisar (Haryana), India

[3]Ph.D., Department of Livestock Production Management, LUVAS, Hisar (Haryana), India

[4]PhD. Department of Veterinary Physiology and Biochemistry, LUVAS, Hisar (Haryana), India

DOI: https://doi.org/10.33545/26180723.2024.v7.i6f.745

Corresponding Author: Ramkaran

Abstract

The present study aimed to assess the prevalence of gastrointestinal parasites (GIP) in equines across Haryana. A total of 1500 fecal samples were collected from horses (967), donkeys (178), and mules (355) in randomly selected villages across three distinct agro-climatic zones: arid (500 samples), semi-arid (500 samples), and dry sub-humid (500 samples). Qualitative methods were employed to examine these samples for the presence of gastrointestinal parasites. Among horses, the prevalence of gastrointestinal parasite infection was notably higher on unpaved (kachha) floors (73.77%) compared to paved (pakka) floors (51.91%). Similarly, among donkeys, the prevalence was higher on pakka floors (58.22%) than on kachha floors (56.25%). Mules also showed a higher prevalence of gastrointestinal parasites on kachha floors (68.18%) compared to pakka floors (57.09%). These findings underscore the variability in parasite prevalence based on flooring types commonly found in equine environments across different agro-climatic zones in Haryana.

Keywords: Equines, gastrointestinal parasites, qualitative methods, floor type

Introduction

Gastrointestinal parasitism poses a significant health challenge to horses globally, impacting their productivity and welfare (Alaba *et al*., 2022) [1]. These parasites cause varying degrees of harm depending on their type, quantity, location within the host, and the host's immune response, resulting in substantial economic losses (Papazaharidou *et al*., 2009). Common helminth infections such as those caused by nematodes, trematodes, and cestodes are prevalent among grazing horses, with parasites like large and small strongyles and ascarids presenting notable challenges (Brady and Nichols, 2009) [4]. Clinical signs of these infections include weight loss, poor coat condition, intermittent diarrhea, lethargy, peripheral edema, and disruptions in intestinal function. Colic, a leading cause of equine mortality worldwide, is often linked to intestinal parasitic infestations, contributing significantly to morbidity and mortality rates and reducing working capacity.

Globally, the equine population is estimated at 58.7 million, with Asia hosting 13.8 million equines (FAO STAT, 2008) [6]. In India, the equine population totals 0.54 million across urban and rural areas, with approximately 0.10 lakh located in Haryana alone (Census GOI, 2019) [5]. These animals play vital roles in agriculture and related sectors, predominantly in rural areas where they are kept in stud farms, breeding facilities, or utilized for transportation and livelihood activities by local communities.

Diagnosing gastrointestinal helminth infections typically relies on clinical signs and traditional parasitological methods such as fecal examinations. However, the accurate diagnosis of strongylosis via fecal microscopy is often challenging, especially in cases of mixed infections prevalent in field conditions, where species differentiation may be inadequate even at the sub-family level (Lichtenfels *et al*., 2008) [8]. Consequently, coproculture for larval cultivation represents the most practical approach to distinguish between large and small strongyles based on the morphology of third-stage larvae (L3) (Andersen *et al*., 2013; Anutescu *et al*., 2016) [2, 3].

Understanding the epidemiology and prevalence of equine parasitism is essential for developing effective control strategies against gastrointestinal parasitism. Utilizing advanced parasitological and molecular techniques to accurately assess infection prevalence and intensity helps optimize treatment protocols, thereby minimizing the risk of anthelmintic resistance and preventing unnecessary medication overdosing. This comprehensive approach is crucial for improving equine health management practices and ensuring sustainable productivity in agricultural settings.

Materials and Methods

Sample collection

Fresh fecal samples were promptly collected from equines

and transported to the department of veterinary parasitology, luvas, hisar, on the day of collection. Samples were stored at 4˚c in a refrigerator until further processing.

Sampling methodology

Sampling was conducted in randomly selected villages across each agro-climatic zone where equines were prevalent. A minimum of 125 fecal samples per zone were collected during each season—winter, summer, monsoon (rainy), and spring—over a one-year period from november 2021 to october 2022.

Sample processing

Qualitative examination

Identification of parasitic eggs in fecal samples was performed using microscopy techniques, specifically employing flotation and sedimentation methods (soulsby, 1982) [13].

Statistical analysis

Associations between evaluated variables and positive parasite reactions were analyzed using the chi-square test. Statistical significance was set at a probability of error less than 5% ($p<0.05$). Data analysis was conducted using sas software version 9.3 (sas institute, cary, usa).

Results

The prevalence of gastrointestinal parasites of equines in Haryana with relation to different floor type is depicted in table 1

Table 1: Prevalence of gastrointestinal parasites in Equines of Haryana in relation to floor type

Factors	Floor Type Levels	Examined	Positive	Positive (%)	Odd ratio	95% CI	P value
Horses	*Pakka*	784	407	51.91	0.52	0.30-0.90	0.02
	Kachha	183	135	73.77			
Donkeys	*Pakka*	146	85	58.22	0.65	0.22-1.92	0.43
	Kachha	32	18	56.25			
Mules	*Pakka*	289	165	57.09	0.77	0.35-1.68	0.51
	Kachha	66	45	68.18			

Prevalence of Gastrointestinal Parasites in Equines of Haryana Based on Floor Type

Horses

In our study, 967 horse fecal samples were analyzed, with 784 samples from horses kept on pakka floors and 183 on kachha floors. The prevalence of gastrointestinal parasite infections was notably higher among horses reared on kachha floors (73.77%) compared to those on pakka floors (51.91%). Statistical analysis using odds ratios indicated a significantly lower likelihood of positive gastrointestinal parasite presence in horses on pakka floors (OR = 0.52; 95% CI=0.30-0.90) compared to the reference category of kachha floors (OR = 1.00).

Donkeys

Among 178 donkey fecal samples examined, 146 samples were from donkeys kept on pakka floors and 32 on kachha floors. The prevalence of gastrointestinal parasites among donkeys was slightly higher on pakka floors (58.22%) compared to kachha floors (56.25%). Odds ratio analysis suggested a non-significantly lower likelihood of positive parasite presence in donkeys on pakka floors (OR = 0.65; 95% CI=0.22-1.92) relative to kachha floors (OR = 1.00).

Mules

For mules, 355 fecal samples were screened, with 289 samples from mules on pakka floors and 66 on kachha floors. Gastrointestinal parasite prevalence was higher among mules on kachha floors (68.18%) compared to those on pakka floors (57.09%). Odds ratios indicated a non-significantly lower likelihood of positive parasite presence in mules on pakka floors (OR = 0.77; 95% CI=0.35-1.68) compared to kachha floors (OR = 1.00).

These findings underscore the impact of floor type on the prevalence of gastrointestinal parasites among equines in Haryana, highlighting kachha floors as potentially contributing to higher parasite burdens compared to pakka floors. Further research into environmental and management factors influencing parasite transmission and control strategies is warranted to mitigate parasitic infections in equine populations.

Discussion

Similar trends in floor-related prevalence of gastrointestinal parasite infections have been noted in previous research. Radostits *et al*. (2009) [11] reported a higher prevalence of infections in horses kept on ground surfaces compared to those housed on concrete floors, echoing our findings of elevated parasite burdens among equines on kachha floors in Haryana. Jajere *et al*. (2016) [7] also documented significantly higher rates (P<0.001) of helminthic infections in donkeys from rural settings, particularly those managed on kachha floors.

The difference in parasite prevalence between floor types can be attributed to several environmental factors. Cemented floors are easier to clean and maintain, reducing the accumulation of fecal matter and potential exposure to infective stages of parasites. Moreover, cemented surfaces dry more quickly, leading to lower moisture levels that are unfavorable for the survival of parasite eggs and oocysts (Rehman *et al*., 2021) [12]. These conditions contribute to a reduced risk of parasitic infections among equines housed on concrete floors compared to those on kachha floors, where moisture retention and organic material buildup may facilitate parasite transmission.

These insights underscore the importance of flooring type in influencing the prevalence and control of gastrointestinal parasites in equine populations, suggesting that management practices promoting clean and dry environments could mitigate the impact of parasitic infections in agricultural settings.

Conclusion

This study highlights the significant impact of floor type on

the prevalence of gastrointestinal parasites among equines in Haryana. Equines housed on kachha floors exhibited higher parasite burdens compared to those on pakka floors, observed consistently across horses, donkeys, and mules. These findings align with previous research indicating that cemented floors facilitate easier cleaning and faster drying, reducing the risk of parasite transmission.

To improve equine health and productivity, adopting cemented flooring and enhancing environmental hygiene are crucial. These measures can mitigate parasite infections, thereby promoting better health outcomes and economic productivity in equine populations. Further research should explore additional environmental and management factors influencing parasite dynamics to refine preventive strategies for sustainable equine health management in agricultural settings.

References

1. Alaba BA, Olajide EO, Omotosho OO, Okemiri DC. Prevalence, Severity and predisposing factors of gastrointestinal parasite infection in polo horses in Ibadan, Nigeria. J Vet. Sci. 2022;7(3):80-85.
2. Andersen UV, Hakansson IT, Roust T, Rhod M, Baptiste KE, Nielsen MK. Developmental stage of strongyle eggs affects the outcome variations of real-time PCR analysis. Vet. Parasitol. 2013;191:191-96.
3. Anutescu SM, Buzatu MC, Gruianu A, Bellaw J, Mitrea IL, Ionita M. Use of larval cultures to investigate the structure of strongyle populations in working horses, Romania: preliminary data. Agro Life Sci. J. 2016;5(1):9-14.
4. Brady HA, Nichols WT. Drug resistance in equine parasites: An emerging global problem. J Equine Vet. Sci. 2009;29:285-295.
5. Census. A technical note on the 19th all India livestock census. Government of India, Ministry of Agriculture, Department of Animal Husbandry and Dairying, Krishi Bhawan, New Delhi. 2019.
6. FAOSTAT. Statistics of Food and Agriculture Organisation of the United Nations, Rome (Internet source). 2008.
7. Jajere SM, Lawal JR, Bello AM, Wakil Y, Turaki UA, Waziri I. Risk Factors Associated with the occurrence of gastrointestinal helminths among indigenous donkeys (*Equus asinus*) in north-eastern Nigeria. *Scientifica.* 2016, p. 1-7.
8. Lichtenfels JR, Kharchenko VA, Dvojnos GM. Illustrated identification keys to strongylid parasites (Strongylidae: Nematoda) of horses, zebras and asses. Vet. Parasitol. 2008;4:156-161.
9. Papazahariadou M, Papadopoulos E, Diakou A, Ptochos S. Gastrointestinal parasites of stabled and grazing horses in Central and Northern Greece. J Equine Vet. Sci. 2009;29(4):233-236.
10. Proudman C. Intestinal Parasites and Equine Colic. U S Companion Animal Health, 2006, p. 12-13.
11. Radostits OM, Blood DC, Gay CC. Veterinary medicine a textbook of the diseases of cattle, sheep, pigs, goats, and horses. Bailliere Tindall, London, Philadelphia, 2009, p. 1181-1199.
12. Rehman T, Saeed Z, Zaman MA, Sikandar A, Ali HM. Factors affecting the incidence of *Eimeria leucarti* in horses. Agrobiol.l Records. 2021;6:13-17.
13. Soulsby EJL. Helminthes, Arthropods and Protozoa of Domesticated Animals. 7th Edn, The English Language Book society, Bailliare Tindall, London, 1982, p. 763-766.