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Prevalence and risk factors associated with Equine strongylosis in Baybay City, Leyte, Philippines

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ABSTRACT

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Strongylosis is a pressing equine health problem. This study determined the prevalence and risk factors associated with strongylosis in horses in Baybay City, Leyte, based on its egg morphology. A total of 263 horse fecal samples were collected and examined. Nematode eggs were identified using Modified McMaster technique. Other relevant epidemiological data associated with strongyle infections were also collected using a structured questionnaire. Descriptive statistics and logistic regression analyses were carried out to determine the prevalence and risk factors associated with strongylosis in horses.

Results showed an overall prevalence of 97.72% (257/263; 95% CI=95.10-99.16); of which, 92.78% (244/263; 95% CI=91.18-94.37) were cyathostomins and 67.30% (177/263; 95% CI=64.41-70.19) were *Strongylus sp.* Logistic regression analyses revealed a significant association between *Strongylus sp.* infection and moderate body condition score (*p*-value=0.0006), housing in a shed (p-value = 0.0255), and tethering of the horse (*p*-value=0.0116).

The high prevalence rate of equine strongyle infection in Baybay City, Leyte, could indicate the neglect and underestimation of the disease for a considerable period of time. Thus, active clinico-epidemiological investigations are warranted in order to design and establish cost-effective and sustainable control and preventive approaches.

Keywords: cyathostomin, epidemiology, horses, strongyle, *Strongylus sp.*

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INTRODUCTION

Equine strongylosis is ubiquitous worldwide causing pathological damage in grazing horses (Nielsen and Reinemeyer 2018). This parasitic disease is generally induced by the large and small strongyle nematodes under the Family Strongylidae. More specifically, the large strongyle species *Strongylus equinus, S. edentatus* and *S. vulgaris* are said to be the most common and pathogenic equine endoparasites (Foreyt 2013, Mandal 2006), although naturally-infected horses can typically carry a combination of small and large strongyles within the intestinal tract of the host (Owen and Slocombe 1985). Strongyle infection is a complex pathological state, resulting in an inflammatory enteropathy with decreased intestinal motility and impaired microcirculatory processes (Pilo et al 2012). Small strongyle infection, particularly, can lead to inappetence, diarrhea, weight loss, weakness, edema, poor hair coat and disturbed intestinal motility, among other clinical presentations (Corning 2009, Lyons et al 2000). On the other hand, large strongyle infection causes multisystemic disturbances such as inflammation, fibrosis and necrosis of the cranial mesenteric artery (Kuzmina et al 2012). Furthermore, thromboembolism and intestinal infarction can result in colic and eventual death of infected horses (Marinković et al 2009). Thus, eradication of the parasites should be done on a regular basis since strongyles' enormous egg production can quickly contaminate a small space. Thiabendazole is extensively used and numerous additional anthelmintics, notably benzimidazole derivatives, have lately been discovered and licensed for prescription in adult horses (Kaur et al 2019).

Unfortunately, the current constraint revolves around the effectiveness of anthelminthic drugs after numerous reports of anthelmintic resistance (Andersen et al 2013, Schneider et al 2014). For instance, cyathostomins were reported to develop anthelmintic resistance towards benzimidazoles, macrocyclic lactones, and pyrantel (Kaplan 2002, Nielsen et al 2020, Salas-Romero et al 2018, Traversa et al 2009). Moreover, Nielsen et al (2012) revealed the resurgence of *Strongylus* infection, possibly linked to the reduction in the frequency of anthelmintic treatments. Hence, in remote regions of many developing countries, internal parasitism like strongylosis with reported prevalence ranges from 70-90%, still accounts for the high mortality of horses (Ioniță et al 2013, Matthews 2011). This shows a significant correlation between poverty and veterinary diseases such as parasitic infestations in equines (Perry 2002). Therefore, there is a need to design and implement an effective, systematic, and sustainable deworming program and herd health management system in a resource-limited setting in order to reduce the prevalence and relative burden of the disease (Sori et al 2017).

Formulating an effective and efficient anthelmintic regimen depends on the faunistic and prevalence data of parasites among horse populations. Several studies related to the prevalence of equine strongylosis were conducted in other parts of the globe such as in Egypt (Hamed et al 2019), Italy (Maestrini et al 2020), Ethiopia (Mathewos et al 2021), and Canada (Butler et al 2021). These studies have reported numerous species of equine strongyles with high prevalence. However, studies that address identification and distribution of strongyles in remote regions of developing countries, including the Philippines, are very limited and not given enough attention

(Ali et al 2018, Fuehrer et al 2012). As far as the authors' knowledge is concerned, the prevalence of equine parasites in the Philippines, especially strongyles, has yet to be updated. In the study conducted by Antiporda and Eduardo (1990), the nematode *Cylicostephanus longibursatus* was the most prevalent (95%), followed by *Cyathostomum catinatum* and *Cylicocyclus nassatus* (each at 92.5%), *Habronema muscae* (75%), *Cylicostephanus minutus* and *C. goldi* (70%), *Cylicostephanus calicatus* (65%), *Cyathostomum coronatum* (62.5%), *Cylicocyclus insigne* (60%), *Cylicocyclus leptostomus* and *Cyathostomum pateratum* (each at 55%), *Strongylus vulgaris* (45%), *Cyathostomum labiatum* (42.5%), *Oxyuris equi* (37.5%), *Draschia megastoma* (32.5%), *Triodontophorus nipponicus* (22.5%), *Cyathostomum labratum, Cylicocyclus radiatus* and *Gyalocephalus capitatus* (each at 20%), *Cylicostephanus poculatus, Setaria equina* and *Habronema majus* (each at 12.5%), *Cylicodontophorus bicoronatus* and *Triodontophorus serratus* (each at 10%), *Cylicocyclus elongatus* (7.5%), Strongylus edentatus (6%), and *Strongylus equinus, Cylicocyclus triramosus, Parascaris equorum,* and *Probstmayria vivipara* (each at 5%). Additionally, *Anoplocephala perfoliata* (62.5%) was the sole cestode species recovered. This was also the first study to report the prevalence of *Cyathostomum labratum*, *Cylicostephanus poculatus* and *Cylicocyclus triramosus* in the country. Therefore, the present study aims to provide updated information on the prevalence and risk factors associated with strongyle infections affecting horses in Baybay City, Leyte.

The results of the study are vital for policymakers, veterinarians, horse raisers, and other concerned stakeholders in devising effective, sustainable, epidemiologically-sound, and economically-viable parasite control programs. This could also serve as baseline data for future plans in generating researches and other health intervention programs.

MATERIALS AND METHODS

Study Area

The City of Baybay is located on the western coast of the province of Leyte, Philippines. This area is generally mountainous at the east and slopes down to the west towards the shoreline (Figure 1). With an area of 46,050 hectares, Baybay City has 92 *barangays* (villages), of which, 10 are urban and 82 are rural. This is the second largest city in the province of Leyte located approximately 124'47'30" E Longitude and 10'41 N Latitude. The common means of livelihood is farming and fishing (LGU Baybay City 2013).

Sampling Design

The study involved a random sampling method focusing on equine health management and practices in 13 barangays of Baybay City, Leyte. These barangays were identified by the City Agriculture Office as the locations within the study area where horses were raised. The study employed a cross-sectional method involving a one-stage cluster sampling technique. The StatCalc menu of the Epi Info 7 software (Centers for Disease Control and Prevention, USA) was used to determine the sample size. Ideally, at the level of 95% confidence interval, at least 30 horses should be sampled per barangay, for a total of 390 samples. However, the actual horse population was below the required sample size, resulting in the collection of 263 samples from the 13 barangays of Baybay City, Leyte.

Figure 1. Map of Baybay City, Leyte (Source: PHILGIS)

Survey Methodology

A structured survey questionnaire was designed to capture information related to epidemiological factors potentially associated with strongylosis in horses.

Owners were interviewed during the collection of horse fecal samples. The questions were constructed in English but were translated into the local dialect during the interview. Moreover, morbidity parameters associated with parasitism, particularly body condition score (BCS) and diarrheal score (DS), were evaluated based on the protocols adapted by Dorny et al (2011). The following body condition scoring system was adapted: BCS 1=emaciated; BCS 2=very thin; BCS 3=thin; BCS 4=good; and BCS 5=very good. Subsequently, the following diarrheal scoring system was applied to check for fecal consistency: DS 1=normal; DS 2=soft; and DS 3=watery.

Fecal Examination and Egg Identification

Fecal collection was done non-invasively. By doing so, samples were collected without directly contacting the rectal surface of the horses. Instead, feces were gathered from the topmost portion of freshly voided fecal matter of the horses. Hence, handling was minimal and based on the standard guide for the care and use of agricultural animals in research by the National Research Council (2010). Fecal samples were initially examined for consistency to aid in diarrheal scoring. The McMaster technique was performed based on the procedures of Zajac et al (2014) with some modifications. Briefly, 4g of feces and 26mL flotation solution were mixed to make a total of 30mL fecal mixture. A Whitlock Universal slide was used and each chamber was filled with the mixture and viewed under the microscope using 10x objective lens. Furthermore, an ocular micrometer was set-up and calibrated to measure the dimension of the eggs. Each type of nematode egg was counted and identified according to size (length x width), shape, and wall characteristic. This test has a specificity of identifying the eggs up to genus level and an analytical sensitivity of 25 eggs per gram of feces (Zajac and Conboy 2011).

Data Management and Statistical Analysis

Data from the questionnaire were organized and cleaned using Microsoft Excel 2010. The prevalence of strongyle infection in horses in Baybay City, Leyte was computed using the formula of Thrusfield (2018):

$$\text{Proportion} = \frac{\text{Number of positive samples}}{\text{Total number of horses examined}} \text{x100}$$

The estimated confidence interval for the proportion positive was obtained using the standard method of calculating confidence interval at 95 % for an infinite population (Martin et al 1987), which was computed using the formula:

$$\text{SE (p)} = [p(1-p)/n]^{\frac{1}{2}}$$

Where:

p=proportion positive n=sample size SE=standard error

A 95% confidence interval was constructed using the upper and lower limit of the interval defined by p± 1.96 x SE (p).

All data derived from the interview of horse raisers were analyzed using Epi-Info™ version 7 (Centers for Disease Control and Prevention, USA) for assessing the unconditional associations between equine strongyle infection (dependent variable) and the risk factors (independent variables). Chi-square test was used to analyze the statistical significance for non-continuous variables, while Kruskal-Wallis for continuous variables. Identified risk factors with a p-value of <0.20 during the univariate analyses were included in the multivariate logistic regression model using a 95% confidence interval. Backward elimination process was done, with *p*-value <0.05 as the limit.

RESULTS

Description of Equine Raisers, Horse Population and Management Practices

The age of horse raisers ranged from 19 to 75 years old (mean=41.72 years; median=40 years). The majority of them were male (155/162; 95.68%) and married (97.53%; 158/162). Each farmer raised an average of 1.62 horses, with a median of one.

The horses included in the study were Philippine natives coming from the 13 barangays of Baybay City, Leyte where the City Agriculture Office reported horses to be raised. Table 1 summarizes the number of horses sampled in each barangay. The age of the horses involved in the study ranged from 2-204 months old (mean=83.98 months; median 84 months) and the majority were male (171/263; 65.02%). Most of the horses were mainly used for draft purposes (84.03%), while others were utilized for production (11.03%) and leisure (4.94%).

Table 1. Number of horses sampled within the study area

Barangay	Total count (n=263)	Percentage
San Juan	33	12.55%
Amguhan	30	11.41%
Ampihanon	30	11.41%
Ciabo	29	10.03%
Maypatag	28	10.65%
Sapa	20	7.60%
Banahao	19	7.22%
Kabungaan	19	7.22%
Zacarito	18	6.84%
Pomponan	13	4.92%
Kabalasan	11	4.18%
Lintaon	11	4.18%
Balao	2	0.76%

The majority of the horses were tethered from late afternoon until dawn (93.54%), while 3.80% were kept corralled, and only 2.66% were tethered early in the morning and housed in a shed in the evening. Most of the horse raisers also constructed shelters made from wooden materials (97.34%). The majority of the horses were raised together with other animals (88.59%), such as dogs and chickens (60.46%), dogs (24.33%), and cattle (3.80%). Horse raisers regularly bathed their animals early in the morning with soap and water. Some horses were waded in rivers (1.90%) or were bathed in streams (11.03%), but the majority of the horse raisers were using water from the faucet (87.07%). On the other hand, horse raisers irregularly cleaned their animals' shelter and removed the dungs using brooms and/or dust pans (95.44%), without proper disinfection.

The most commonly observed health problems were lameness (72.24%), swelling of abdomen and legs (19.77%), and emaciation (7.98%). All horse raisers practiced self-medication and deworming was seldom practiced. Examination of the horses during the actual field visits showed that most of the animals had moderate body condition score (80.99%) and feces were firm in consistency (93.92%).

Prevalence of Equine Strongyles

The prevalence of equine strongyle infection based on fecal examination is presented in Table 2, wherein large strongyles (*Strongylus sp.*) and small strongyles or cyathostomins were recovered (Figure 2). The overall prevalence was 97.72% (257/263; 95% CI=95.10-99.16). At the animal-level prevalence, cyathostomin infection was higher at 92.78% (244/263; 95% CI=91.18-94.37) compared to *Strongylus sp*. at 67.30% (177/263; 95% CI=64.41- 70.19). Mixed infections were also noted at 49.43% (130/263; 95% CI=43.23-55.64).

Table 2. Prevalence of strongyles in horses in Baybay City, Leyte

Parasite	n/N	Prevalence (%)	95% CI
	Mono-infection		
Cyathostomins	244/263	92.78	91.18-94.37
Strongylus sp.	177/263	67.30	64.41-70.19
	Mixed infection		
Cyathostomins + *Strongylus sp.*	130/263	49.43	43.23-55.64

n/N=positive horses or herd over the total number of horses or herd; CI=confidence interval

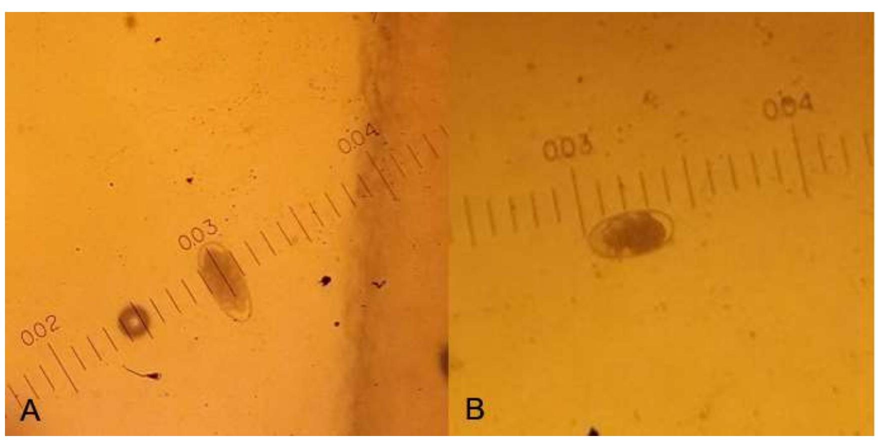

Figure 2. Egg morphology of equine strongyles in Baybay City, Leyte under 100x magnification. (A) Egg of *Cyathostoma sp.* Size: 117µmx52µm; Shape: Long, ovoid, poles almost similar; Wall: Fine, smooth surface, parallel egg walls. (B) Egg of *Strongylus sp.* Size: 104µmx52µm; Shape: Ovoid; Wall: Fine, smooth surface, rounded walls

Risk Factor Analysis for Strongylus sp.

The univariate analysis showed 25 putative risk factors that were unconditionally associated with *Strongylus* sp. infection in horses (*p*-value <0.20) (Table 3). These variables were then analyzed through backward elimination process in the multivariable regression model. As shown in Table 4, results revealed that moderate body condition score (OR=0.12; p=0.0006), housing in a shed (OR=11.45; p=0.0255) and tethering (OR=7.63; p=0.0116) were significant risk factors associated with *Strongylus sp.* infection in horses. More specifically, horses housed in sheds and tethered were found to be twelve and eight times more likely to present with *Strongylus sp.* infection, respectively. Horses with moderate body condition score, on the other hand, were found to be inversely associated with the large strongyle infection.

Table 3. Univariate regression model of risk factors unconditionally associated with *Strongylus sp.* infection in horses in Baybay City, Leyte

Variables	STAT	n/N	*Strongylus* sp. -	*Strongylus* sp. +	Crude Odds Ratio (95% CI)	*p*-value
Civil Status						
Single		4/162	1	5	0.40 (0.05-3.52)	0.1352
Married		158/162	85	172		
Horse Purpose	log					
Draft		221/263	63	158	1.00	-
Production		29/263	13	16	0.49 (0.22-1.08)	0.0766
Leisure		13/263	10	3	0.12 (0.03-0.45)	0.0017
Method of Keeping	log					
Corralled		10/263	8	2	1.00	-
Tethered		246/263	74	172	9.29 (1.93-44.80)	0.0055
Tethered and shed		7/263	4	3	3.00 (0.35-25.87)	0.3174
Type of Building	x^2				13.20 (1.56-111.46)	0.0087
None		7/263	6	1		
Shed		256/263	80	176		
Other Animals in Contact	x^2					
None		28/263	2	26	7.23 (1.67-31.23)	0.0046
Dogs		64/263	14	50	2.02 (1.04-3.92)	0.0490
Dogs and chickens		159/263	61	98	0.51 (0.29-0.88)	0.0222
Cattle		10/263	8	2	0.11 (0.02-0.54)	0.0036
Body Condition Score	x^2					
Moderate		213/263	83	130	0.10 (0.03-0.33)	0.0000
Moderately thin		50/263	3	47		

Table 3 continued

Variables	STAT	n/N	*Strongylus* sp. -	*Strongylus* sp. +	Crude Odds Ratio (95% CI)	*p*-value
Fecal Consistency	x^2					
Normal		247/263	86	161	-	0.0092
Soft		16/263	0	16		
Water Source	Log					
Faucet		229/263	70	159	1.00	-
Stream		29/263	16	13	0.36 (0.16-0.78)	0.0102
River		5/263	0	5	283138.09 (0.00->1.0)	0.9721
Deworming	x^2				0.62(0.36-1.09)	0.1271
Yes		80/263	32	48		
No		183/263	54	129		
Date Dewormed	x^2					
December 2016		15/263	10	5	0.22 (0.07-0.67)	0.0092
April		5/263	4	1	0.12 (0.01-1.06)	0.0726
Disease Occurrence	log					
Emaciation		21/263	11	10	1.00	-
Lameness		190/263	39	151	0.23 (0.09-0.59)	0.0022
Swelling of Abdomen and Legs		52/263	36	16	0.11 (0.06-0.23)	0.0000
Culling	x^2					
Danger to man		14/263	9	5	0.25 (0.08-0.77)	0.0217
Feeding System	x^2					
					5.09 (0.64-40.42)	0.1686
Free Range		11/263	1	10		
Free Range & Stall Feeding		252/263	85	167		
Feed Placement	x^2					
Soil		11/263	1	10	5.09 (0.64-40.42)	0.1686
Tire		225/263	63	162	3.94 (1.93-8.04)	0.0001
Rubber tub		4/263	3	1	0.16 (0.02-1.53)	0.2005
Basin		12/263	10	2	0.09 (0.02-0.41)	0.0004
Concrete Feeding trough		11/263	9	2	0.10 (0.02-0.46)	0.0012

Table 3 continued

Variables	STAT	n/N	*Strongylus* sp. -	*Strongylus* sp. +	Crude Odds Ratio (95% CI)	*p*-value
Vitamins	x^2				0.23 (0.10-0.52)	0.0004
Yes		28/263	18	10		
No		235/263	68	167		
Feed Supplement	x^2					
Yes		28/263	21	7		
No		235/263	65	170	0.13 (0.05-0.31)	0.0000

Table 4. Multivariable logistic regression of risk factors associated with *Strongylus sp.* infection in horses in Baybay City, Leyte

Variables	AOR	95% CI	COEF	SEM	*p*-value
Moderate BCS (1/0)	0.12	0.04-0.41	-2.11	0.62	0.0006
Building of shed (1/0)	11.45	1.45-97.11	2.44	1.10	0.0255
Method of Keeping					
Corralled (0)	1.00	-	-	-	-
Tethered (1/0)	7.63	1.57-36.98	2.03	0.80	0.0116
Tethered and Shed (2/0)	3.00	0.35-25.87	1.10	1.10	0.3176

AOR = adjusted odds ratio; CI = confidence interval; COEF = coefficient; SEM = standard error of margin

Risk Factor Analysis for Cyathostomins

There were six putative risk factors identified to be unconditionally associated with *Cyathostoma sp.* infection in horses (*p*-value <0.20) (Table 5). These variables were further analyzed through a backward elimination process in a multivariable regression model to identify the most significant risk factors (*p*-value <0.05). As shown in Table 6, the most significant risk factors associated with *Cyathostoma sp.* infection in horses were deworming during March (OR=0.18; *p*-value=0.0137) and April (OR=0.08; *p*-value=0.0095). However, these results could be due to the time in which deworming of horses was done by farmers during or a month prior to the time of the conduct of the study. Specifically, 30.42% of the sampled horses were dewormed by the owners at the time of the study. Thus, the result may be statistically significant but not epidemiologically sound.

Table 5. Univariate regression model of risk factors unconditionally associated with cyathostomin infection in horses in Baybay City, Leyte

Variables	STAT	n/N	*Cyathostoma* sp. -	*Cyathostoma* sp. +	Crude Odds Ratio (95% CI)	*p*-value
Gender					5.24 (1.28-21.41	0.04947
Male		155/162	15	236		
Female		7/162	3	9		
Body Condition Score	x^2					
Moderate		213/263	18	195	-	0.0690
Moderately thin		50/263	0	50		
Deworming	x^2				-	0.0000
Yes		80/263	18	62		
No		183/263	0	183		
Date Dewormed	x^2					
February 2017		48/263	12	36	0.09 (0.03-0.24)	0.0000
March 2017		12/263	3	9	0.19 (0.05-0.78)	0.0495
April		5/263	2	3	0.10 (0.02-0.64)	0.0384

Table 6. Multivariable logistic regression of risk factors associated with cyathostomin infection in Baybay City, Leyte

Variables	AOR	95% CI	COEF	SEM	*p*-value
Deworming					
March (Yes/No)	0.17	0.04 – 0.69	-1.79	0.73	0.0137
April (Yes/No)	0.08	0.01 – 0.55	-2.48	0.96	0.0095

AOR = adjusted odds ratio; CI = confidence interval; COEF = coefficient; SEM = standard error of margin

DISCUSSION

As the first epidemiological investigation of equine strongyle infection in the rural barangays of Baybay City, Leyte, the study identified cyathostomins and *Strongylus sp*. based on coproscopic evaluation of their egg morphologies. More particularly, cyathostomins were found to be more prevalent (92.78%) compared to *Strongylus sp*. (67.30%). Hence, Love et al (1999) considered these small strongyles as the "principle parasitic pathogen of horses." According to the European Scientific Counsel Companion Animal Parasites (2019), horses can be afflicted with more than 40 different species of cyathostomins, and a single horse can be infested with up to ten different small strongyle species at the same time. Cyathostomins can induce larval cyathostominosis, a syndrome caused by the synchronized resumption of the growth of several encysted third stage larvae and the concurrent influx of mucosa-dwelling larval phases into the lumen, resulting in extensive tissue damage (Peregrine et al 2006, Wobeser and Tataryn 2009). Lethargy, weight loss, edema, diarrhea, pyrexia, colic, intussusception, infarction and eventual death of horses were reported to be attributed to small strongyle infection (Mair et al 2000, Rendle 2014, Roumen et al 2004).

Compared to cyathostomins, *Strongylus sp.* are migratory strongyles. Thus, lesions can be found in several organs like the pancreas, liver, lungs, omentum, cecum, and colon (McCraw and Slocombe 1985, Petty and Hattingh 1992). This poses more devastating pathlogical consequences than the former strongyles. *Strongylus vulgaris,* for example, can wreak havoc with the cranial mesenteric artery and its branches, obstructing the blood circulation to the gut. This can result in colic, necrosis, reduced intestinal movement, intestinal twisting, intussusception, infarction, hemorrhages, and intestinal perforation (Kaur et al 2019, Pihl et al 2018). More so, these parasites can potentially harm the central nervous system (Furr 2015). In addition, the larvae of *S. equinus* can migrate to the liver and pancreas, while that of *S. edentatus* moves towards the flank or liver, thereby inducing hemorrhagic nodules and inflammatory conditions(Kaur et al 2019).

Subsequently, the present study revealed that horses housed in sheds (OR=11.45) and mainly tethered (OR=7.63) were found to be twelve and eight times more likely to acquire *Strongylus sp.* infection, respectively, than those horses that were kept corralled without shed. Horse manure, as the major source of infection, is concentrated and contains less moisture resulting in higher worm egg counts. The number of eggs shed per gram of feces influence the contamination rate of the environment (Stromberg 1997). Since its life cycle is direct (Bowman and Bowman 2008, Corning 2009) the more eggs shed into the environment, the greater the chance for re-infection. Furthermore, infective larvae can be found almost everywhere where they can find protection from sunlight, desiccation, cold temperature and other adverse conditions (Baudena et al 2000, Corning 2009). Since no shelter disinfection was practiced in all sampled horses, other possible sources of infection could not only be from manure but other manure-contaminated objects surrounding the animal (eg, around the water and feeding troughs, on the animals themselves, grass, feed, etc. Thus, aside from timely deworming of horses, proper sanitation needs to be practiced as part of a sound helminth control measure. This can be done by regular cleaning of the animal's environment and other objects that the horses are in constant contact with by thorough dung removal and proper disinfection.

Furthermore, the body condition scoring system is also vital in assessing the general health condition of horses. An apparently healthy horse typically has a body condition score (BCS) of four to six, which corresponds to a moderate BCS (Brady 2002). Thus, in the present study, horses with moderate body condition score (BCS) were found to be inversely associated with *Strongylus sp.* infection. Maintaining an ideal body condition in horses requires a balance between proper nutrition and other health management practices. Without proper nutrition, horses are more prone to developing diseases and infection, including parasitism (Brady 2002).

In conclusion, the high prevalence rate of equine strongyle infection in Baybay City, Leyte, could be attributed to poor equine herd health management practices adopted by the horse raisers. Furthermore, it also indicates the neglect and underestimation of the disease for a considerable period. Thus, active disease surveillance systems are warranted in order to design and establish more cost-effective and sustainable control and prevention approaches.

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