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Identification and Molecular Detection of Ascaris Galli from Smallholdings Poultry Farms Mogadishu Somalia

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Abstract

A cross-sectional study was conducted in the Benadir region, Somalia, from August 2023 to February 2024. The study intended to determine the positive identification prevalence and molecular detection of Ascaris galli in poultry Mogadishu Somalia. A three hundred and eighty four (384) faecal samples from various districts collected from diferent sub district of Banadir region Somalia, revealing 92 out of 384 chickens were positive for Ascaris galli infection, indicating a prevalence of 24% in the study area, there was no significant difference in prevalence between male and female chickens. However, age was a significant factor, with younger chickens (under 6 months) having a higher prevalence (47.3%) compared to adult chickens (over 6 months) with a prevalence of 18.3%. Chickens with poor body condition had a higher prevalence (56%) compared to those with a middle (17.6%) or good (12%) body condition. Extensive production systems had a higher prevalence (31%) compared to intensive systems (17.8%). Chickens raised in cages had a slightly higher prevalence (29%) compared to those on the floor (18.8%) due to better hygiene conditions. The local breed had a slightly higher prevalence (29.2%) compared to the exotic breed (18.8%). Hygiene conditions significantly influenced prevalence, with chickens in poor hygiene conditions having a much higher prevalence (50%) compared to those in good hygiene conditions (6.5%). Availability of deworming treatment in owners also played a significant role, with higher prevalence (26%) in chickens whose owners did not have access to deworming compared to those whose owners did (6.3%).Therefore, Effective control strategies should focus on improving management systems, implementing hygiene practices, and providing deworming treatment. Collaboration with academic institutions and educational programs can help mitigate Ascaris galli infection in chickens in this region.

Keywords: *Identification, Molecular Detection, Ascaris Galli, Poultry Farms, Somalia.*

1. INTRODUCTION

The production of poultry is a significant way to supply humans with high-quality protein. In 1995, it was projected that there were 12.664 million chickens worldwide, with 1.068 million of those being in Africa and 1.164 million in Europe (FAO, 1995). As a result, poultry production contributes significantly to the economy and provides both small and big holder farmers with a revenue stream. In Africa and Europe, the most commonly kept poultry are the domestic chicken (Gallus gallus domesticus), ducks (Carina moschata), turkeys (Meleagris gallopavo) and geese. Among these, the domestic chicken is the most important. (Barre, *et.al.* (2023).

In most Africa countries, practically every family owns some form of poultry, but majority of the birds are unimproved local types which are kept mainly a household scavenger and managed under the open range system. Compared to exotic varieties, the native birds are typically smaller, have lower output, but are stronger, more disease-resistant, and need less food. Animal protein is obtained from the eggs and flesh of the foreign or local breed of domestic fowl, Gallus domesticus, which is raised by both rural and urban householders. farm manure income(Ogbaje, Agbo et al. 2012). In fact, poultry are infested with various parasites. Management system plays an important role in the occurrence of parasitic disease. The parasitic load leads to lower productivity, retarded growth rate and death of birds (Barger 1982, Sykes 1994). Ascariasis caused by Ascaridia galli is a common parasitic problem of chicken both in rural and farm conditions (Haq 1986). A. galli causes extensive economic losses in different ways such as loss of weight gain, meat production, egg production and death of birds (Kamal and Hossain 1989).

Ascaridia galli is one of the most common parasitic roundworms of poultry (Soulsby 1982, Anderson 1992, Permin 1997). Due to the fact that chickens have a variety of eating habits, including consuming faeces, which can contain infectious stages of parasites, helminthosis is a prevalent infectious disease among hens raised in large quantities. The quantity and quality of feed available to scavenging hens is insufficient, which increases their susceptibility to parasite illnesses. In most cases, having a few parasites does not pose an issue. Large populations, however, can have disastrous effects on general health, growth, and egg production. (Debella 2021).

Ascaridia galli is a nematode parasite occurring in all parts of the small intestine. Accurate identification of these parasites at the species level may give directions to treat and control parasitic infection and eliminate the paratenic hosts such as grasshoppers or earthworms, and, therefore, break their life cycle. (Barre, et.al. (2024).

The distribution of intermediate hosts and their infection rate, as well as the quantity of infectious parasite eggs or larvae, can all have an impact on the frequency and severity of parasite infections. Age, sex, and breed are examples of host characteristics that can affect the infection. (Ashenafi and Eshetu 2004). Ascaridia galli is one of the nematodes. The roundworm parasite Ascaridia galli is a member of the nematode phylum. Most common and harmful is Ascaridia galli, which is particularly harmful to domestic village chickens (Gallus domesticus). Due to a high level of Ascaridia spp. infection, it produces ascariasis, a disease that primarily affects village chickens. Since it lives in the small intestine, hemorrhagic enteritis may result. Partial or complete obstruction of the duodenum/jejunum is another consequence of severe infections. There has never been a research to quantify the prevalence of this round worm, despite the fact that A. galli is one of the most prevalent nematodes affecting hens globally. (Amaral and da Costa João 2016). An intestinal parasite called Ascaris galli is frequently found in poultry, especially hens. It is widely present; significant incidence rates have been documented in poultry farms around the world. Ascaris galli was becoming common in chicken farms. Examples of studies that have repeatedly found Ascaris galli to be a serious health risk to chickens include 64% in Denmark, 67-88% in Germany, 84% in England, and 97% in the Netherlands. (Permin, Bisgaard et al. 1999, Kaufmann, Daş et al. 2011, Sherwin, Nasr et al. 2013). Regionally also increase the prevalence of infection for example 22.4% from Nigeria, 95.2% from Zambia and 25.63% in Kenya (Phiri, Phiri et al. 2007, Thapa, Hinrichsen et al. 2015). Ascaris galli also reported from different parts of Ethiopia for example 35.6% from central Ethiopia. (Phiri, Phiri et al. 2007).

The second-highest prevalence rates of Nematoda Ascaris gallus were found in chicken droppings from a Somali poultry farm in the Daynile area of the Banadir region of Somalia, with a rate of 32.5%. The highest prevalence of Nematoda Ascaris gallus was seen in chickens that came into close contact with other chickens' droppings. (Abdi–Soojeede 2020).

Ascaris galli is common in poultry populations and spreads due to a number of risk factors. Since free-range birds are thought to be potential reservoirs for these parasites, these factors—which also significantly contribute to the spread or transmission of Ascaris galli—include drinking water sources, stocking densities or overcrowding, poor biosecurity practices, inadequate sanitation, improper waste management, and the presence of free-range chicken in and around some of these poultry houses. These factors may also pose a risk of contamination to the caged birds. (Rufai and Jato 2017).

2. Material And Methods

A descriptive cross-sectional study was conducted during the period from August 2023 to February, 2024 to assess the prevalence and associated risk factors of Ascaris galli in poultry, before taking the samples the sex, age, breed, hygiene, availability of deworming drugs and body condition of the animals were assessed and recorded.

The population of the study comprises 384 chickens that live in Banadir region, which was used as the target population of this study. Chickens of all ages and sexes were included in this study.

3. Study Area

The study was conducted in the Banadir Region, the most populated region in Somalia, which consists of 17 administrative districts in the capital city of Mogadishu. Specifically, the study focused on poultry farms in 9 districts of Banadir Region: Dharkeynley, Wadajir, Daynile, Garasbaley, Kahda, Hiliwaa, Hodon, Shibis, and Wartanabada. Banadir is located in the southwestern part of Somalia and is the smallest region in that area. It shares borders with the Shabelle River to the northwest and the Indian Ocean to the southeast. The geographical coordinates of Banadir are approximately

Latitude: 2.03333 and Longitude: 45.352° 1′ 60″ North, 45° 21′ 0″ East. The city of Mogadishu, the capital of Somalia, is located within Banadir and has an area of 103 square kilometers with an estimated population of 2,425,000. The average annual rainfall in the region is 399 mm. The climate in Banadir is characterized by hot, oppressive, and windy conditions, with mostly cloudy skies. Throughout the year, temperatures typically range from 75°F to 89°F, rarely falling below 74°F or exceeding 91°F. The temperature difference between the hottest months (December to March) and the coolest months (July and August) is only a few degrees, although it is slightly greater in inland areas compared to the coastal areas. The city is generally at a low elevation, varying from sea level to a maximum of 30 ft. above sea level. It has a hot and semi-arid climate (Metz, 1993).

SAMPLING PROCEDURE

The expected prevalence of Ascaris galli of poultry in the study area was assumed as 50% and the sample size was determined by using the formula given by Thrust field (2005). The parameters used were 95% confidence interval and 5% desired level of precision.

$$N = \frac{Z^2 (Pexp)(1-Pexp)}{d^2} = \frac{(1.96^2)0.5(1-0.5)}{(0.5)^2} = 384$$

Where: N=sample size; Pexp= expected prevalence. D=Desired absolute precision.

4.1. Collection of Faecal Samples Procedure

Faecal samples were properly taken from fresh chicken droppings, collected in a faecal container while wearing gloves for parasitological analysis, properly identified, and transported via ice box within 24 hours while keeping the chain cool. For identification purposes, the box is labelled with the animal's age, sex, date, and location. Following collection, the samples were placed on ice before being transported to the Somali National Laboratory's Veterinary and Animal Science lab, where parasitological procedures were carried out and stored at 4 degrees Celsius for additional analysis. To avoid possible cross-contamination, each faeces sample was collected in a different container box using a different pair of gloves.

4.2. Laboratory Examination

Following collection, the samples were sent straight to the lab for analysis using the direct smear, flotation, and sedimentation techniques outlined by Urquhart et al. (1996) in order to identify parasite ova or larvae and to filter out the positive samples. We used all of the necessary supplies for the procedure, including gloves, pens, paper, lap coat, slides, tubes, cover slips, and sutured solutions. Infective stage of Ascaris galli egg (A) Developmental stage of Ascaris galli egg (B) Mature satge of Ascaris galli egg (C) and Soil Sings for Ascaris galli egg

4.3. Direct Smear

A very tiny quantity of excrement is combined with water or a saline solution in the direct smear method. After placing the mixture on a slide and covering it with a cover glass, use a low power microscope to view the entire smear as stated. by Soulsby18.

4.4. Flotation Method

Although the flotation method of examination is more involved and time-consuming, it is typically more accurate than direct smear. (Zajac and Conboy 2012). Saturated salt solution, saturated sugar solution, or saturated sodium nitrate solution are combined with the excrement. 41% magnesium sulphate solution or 33% zinc sulphate solution. The idea behind the floating method is that the majority of faecal particles sink to the bottom of the tube or vial. Because the weights of the parasite eggs, cysts, and faeces in the solution differ, the parasite eggs and cysts rise to the top of the salt or sugar solution. In pure water, parasite eggs and cysts sink to the bottom instead of floating; however, because the solution is denser in salt or sugar, they float. (Hendrix and Robinson 2012).

4.5. Procedure of Floatation Method

The flotation method involves the use of a flotation solution that has a specific gravity, greater than 1.2, such as a salt or sugar solution. Simple floatation, about one or three gram of faeces is taken and grinded and mixed with 42 ml of saline water, then filter it through a fine sieve or muslin cloth or gauze in to test tube or cylinder until it forms meniscus (up to top of tube). A clean glass slide or cover slide is placed on the mouth of test tube or cylinder. Then left it for 10-15 minute at room temperature without disturbance, then remove cover slide and examine under10 x of microscope. In centrifugation floatation, the first step as simple floatation is similar, except this method use centrifugation. Mixed the contents and centrifuge at 1500 rpm for 5 minutes, the tube is taken out and placed without disturbance. Transfer the

small amount of superficial contents of the tube on a clean and dry glass slide. Place the cover slip on a slide and examine it under a microscope and the parasite ova may be observed under microscope.

4. Data Analysis

A database was created by inserting the raw data from the laboratory analysis and specific sections into a Microsoft Excel spreadsheet. SPSS version 26.0 was used to examine the data that was gathered. Utilising descriptive statistics, the prevalence and Simple statistical techniques like percentage and the Chi square test were used to statistically evaluate the associated risk factors (age, sex, physical condition, and health status) of Ascaris galli on poultry.

5. Results And Discussion

In current study a total of 384 of local and exotic poultry managed under intensive and extensive rearing system of poultry farm production was examined for Ascaris galli, Out of 384 chickens we found 92 chickens were infected by Ascaris galli which indicated 24 % prevalence rate respectively (Table 4.1).

Table1. *Overall prevalence of Ascaris galli of poultry in Banadir region*

Total number	No – Positive	%	No - Negative	%
384	**92**	**24%**	**292**	**76%**

Prevalence of Ascaris galli infection on the basis of Age of Host

Occurrence percentage at different ages of chicken was recorded in our study. Infection rate of Ascaris galli varied with different age group.

The infection rate of Ascaris galli according to age were Adult (>6months) 57 (18.3%) to be positive out of 310 chickens, in young (<6 month) 35 (47.3%) found to be positive in poultry ascariasis out of 74 chickens respectively, there is statistically significance between two age group in poultry ascariasis, X^2 (1,N=384) = 27.407, p value = 0.000 (Table 4.2)

Table 2. *Prevalence of Ascaris galli on the basis of Age*

Age	No of Examined	No of Positive	% Prevalence	X^2	P value
Adult	310	57	18.3%	27.407	0.000
Young	74	35	47.3%		

Prevalence of Ascaris galli infection on the basis of Sex

Out 69 chickens examined were Male, 23(33.3%) of them were found positive, whereas 315 chickens were Female, 69(22%) of them were found positive respectively, a statistical significance different was not observed between prevalence of male and female chickens diagnosed, X^2 (1, N=384) = 4.058, P value = 0.061 (Table 4.3) males chickens were found to have a slightly susceptible and higher prevalence compared to female chicken.

Table 3. *Prevalence of Ascaris galli according to Sex*

Sex	No of Examined	No of Positive	% Prevalence	X^2	P value
Male	69	23	33.3%	4.058	0.061
Female	315	69	22%		

Prevalence of Ascaris galli infection on the basis of Body condition

The body condition score were categorised as Good, Middle and Poor and its prevalence were12%, 17.6% and 56% respectively. There statically significance difference in the prevalence of chicken ascariasis were recorded. X^2 (2, N= 384) = 67.294 p- value = 0.000, higher in poor body condition than good and middle chickens (Table 4.4).

Table 4. *Prevalence of Ascaris galli of poultry according to Body condition*

Body Cond	No – Examined	No - Positive	% Prevalence	X^2	P value
Good	176	21	12%		
Middle	119	21	17.6%	67.294	0.000
Poor	89	50	56%		

Prevalence of Ascaris galli infection on the basis of management System

The prevalence of Ascaris galli of poultry managed under extensive and intensive production system were found to be 31% and 17.8% respectively. Significance difference in the prevalence of Ascaris galli infection were observed between chickens under extensive and intensive production system of the study $X^2(1, N=384) = 9.124$, P- value = 0.003. Extensive production system were found to have a higher prevalence of chicken ascariasis (A.galli) compared to those managed under intensive production system (Table 4.5)

Table 5. *Prevalence of A.galli of poultry according to management system*

Management	No - Examined	No - Positive	% Prevalence	X^2	P-value
Extensive	177	55	31%	9.124	0.003
Intensive	207	37	17.8 %		

Prevalence of Ascaris galli infection on the basis of Housing Method

The prevalence of Ascariasis (A.galli) in chickens reared under soil floor (traditional) and litter floor (modern) were 29% and 18.8% respectively. Statistically significant difference in the prevalence of Ascaris galli of poultry reared in cage and floor house X^2 (1, N= 384) = 5.718,

P - Value = 0.023**,** slightly higher in cages than floor due to high hygiene in litter (Table 4.6).

Table 6. *Prevalence of Ascaris galli in relation to housing method*

Housing	No of Examined	No of Positive	% Prevalence	X^2	P value
Soil floor	192	56	29%	5.718	0.023
Litter Floor	192	36	18.8%		

Prevalence of Ascaris galli infection on the basis of Breed

The prevalence of Ascaris galli of poultry in relation to breed assessed as to be Local and exotic chicken breed type were 29.2% and 18.8% respectively.

Statistically significance difference in prevalence of ascariasis (A.galli) were found between chickens breed (local and exotic) X^2 (1, N=384) = 5.718, P-value = 0.023 (Table 4.7), local breed slightly higher prevalence compared to exotic chicken breed.

Table 7. *Prevalence of Ascaris galli in relation to breed*

Breed	No of Examined	No of Positive	% Prevalence	X^2	P value
Local	192	56	29.2%	5.718	0.023
Exotic	192	36	18.8%		

Prevalence of Ascaris galli infection on the basis of hygiene

Hygiene were categorized as good and poor and its prevalence were 6.5% and 50% respectively. Statistically significance variation in the prevalence of chicken ascariasis (A.galli) were recorded X^2 (1, N=384) = 95.70, P-value = 0.000, higher prevalence in poor hygiene than good hygiene (Table 4.8).

Table 8. *Prevalence of Ascaris galli according to hygiene practice*

Hygiene	No of Examined	No of Positive	% Prevalence	X^2	P value
Good	230	15	6.5%	95.70	0.000
Poor	154	77	50%		

Prevalence of *Ascaris galli* infection on basis of availability of deworming

Deworming were categorized as available and Unavailable and its prevalence were 6.3% and 26.4% respectively. Statistically significance difference in prevalence of Ascaris galli in chicken were recorded X^2 (1, N = 384) = 9.080, P-value = 0.001, higher prevalence of unavailability of deworming in the owner compared to availability of deworming in the owner (Table 4.9).

Table 9. *Prevalence of A. galli based on availability of deworming in the owner*

Deworming	No of Examined	No of Positive	% Prevalence	X^2	P value
Available	47	3	6.3%	9.080	0.001
Unavailable	337	89	26.4%		

Table 10. *Summary of prevalence of A.galli of poultry based on related host & risk factor*

Variables	Categories	No-examined	No- +V	Chi sq. X^2	P value
Age	Adult	310 (18.3%)	57	27.407	0.000
	Young	74 (47.3%)	35		
Sex	Female	315 (22%)	69	4.058	0.061
	Male	69 (33%)	23		
Breed	Local	192 (29%)	56	5.718	0.023
	Exotic	192 (18.8%)	36		
Body condition	Good	176 (12%)	21	67.294	0.000
	Middle	119(17.6%)	21		
	Poor	89(56%)	50		

Table 9. *Summary of A. galli of poultry in relation to management System*

Variables	Categories	No-examined	No- +V	X^2	P value
Hygiene	Good	230 (6.5%)	15	95.70	0.000
	Poor	154 (50%)	77		
Farming System	Intensive	207 (17.9%)	37	9.124	0.003
	Extensive	177 (31%)	55		
Housing Type	Modern (Litter Floor)	192 (18.8%)	36	5.718	0.023
	Traditional (soil floor)	192 (29%)	56		
Availability of Deworming	Available	47 (6.3%)	3	9.080	0.001
	Unavailable	337(26.4%)	89		

Above bar chart summarized area wise prevalence among districts in Benadir region, the samples were collected Daynile, Dharkeynley, Hodon, Hilwaa, Shibis, Wadajir,Garasbaley, Kahda and Wartanabada, every area have occurred percentage prevalence i.e 36.36%, 20.75%,29%, 29.40%, 33.33%, 28%, 18.75%, 43.75% and 0% respectively. There is no significance difference association between districts and prevalence (X^2 (8, N=384) = 13.274, p value = 0.103(Figure 4.1.1). For instance, Kahda has the highest prevalence at 43.75%, while Garasbaley has the lowest prevalence at 18.75%.

6. Discussion

The present study reveals that out of 384 chickens, 92 (24%) were infected by Ascaris galli. An overall prevalence of Ascaris galli of poultry 24 % was found by the study which was in line or similar with the study carried out Ekpa official slaughter in Nsukka Nigeria by Ngongeh (2013) who reported prevalence of 22.3%, Ayudhyinvestia and Sangvaranond (1993) reported 22% A. galli infection in Thailand. The prevalence of A. galli infection was 18% observed by Danicke et al. (2009) in Germany. Abdi sojede

The range of reported prevalence of gastrointestinal helminth infections from other parts of the world varied from (20-60)% Alam et al., (2014). On the other hand the study was not in line with the study carried out Haramaya University in Oromia region, Ethiopia by Faris teni (2014) who reported prevalence of 35.7%. In West Africa especially Ghana several reports indicates that the prevalence rate is between 24-54.3% (poulsen et al. (2000), eyesh-kumi et al. (2016). In east Africa Kenya reports indicate that prevalence of Ascaris galli is between 1.41-33.3% (mungube et al. (2008), kaingu et al. (2010). The variation between the prevalence of this study and other studies carried out elsewhere could be due to the difference in Biosecurity, management system, agro ecology, hygiene practice, and husbandry practice of study chicken in the study area such as overcrowding, faeces accumulation in the floor, leaking water troughs and food contamination or variation is due to geographical location of research area, method of detection and sample size.

In this study, the percentage prevalence of ascariasis was (47.3%) in young (<6months) chickens while (18.3%) in an adult (>6months) chickens. It was observed that there is statistically significance variation ($p<0.05$) in the prevalence of Ascaris galli between two age groups examined. Similar to our findings, bayneh Alemu (2021) reported that young and adult

chicken have the prevalence of 32.14% and 6.66% respectively, at Debrezeit Agricultural Research Poultry Farm in Ethiopia. Abrham Ayele (2019) northwest Ethiopia reports prevalence in the young chickens 68.9% than adult 37.1%, this disparity in incidence by age could be attributable to variances in chicken immunity. Lower immunity development and, as a result, higher sensitivity of younger hens is a possibility. Also, other findings those was not in line to our finding, Zainab et al. (2022) revealed that the prevalence rate in adults was 50% rather than 31.48% in young chickens at Diyala Province in Baghdad. However, high variation was observed between the age categories. Young birds seem to be more susceptible to Ascaridia galli infection than adults that's may due to low immune and lack of management system that manifest greater degree of damage (Ikeme 1971).

In this study, the percentage prevalence of ascariasis (A.galli) was (33%) in male chickens while (22%) in female chickens, However, percentage prevalence was relatively higher in males (33%) than female (22%). It was observed that there is no statistical significance difference (P>0.05) in the prevalence of Ascaris galli and sex (male and female), Similar to our findings, bayneh Alemu (2021) found that higher prevalence rate in males (35.55%) than females (8.65%) at Debrezeit Agricultural Research Poultry Farm in Ethiopia. Oc jegede (2015) at Nigeria reported that higher prevalence rate in male 46.8% than female 40.8%. As reported by Shiferaw (2016),

Rate in and around Ambowest Shoa Zone, Oro mia Regional State, Ethiopia, was 70.45% for m ale and 67.2% for female chickens. Also wasn't similar to our findings, Adnan Yousaf, (2019) that found lower prevalence rate in males (17.22%) than female 22.45% in poultry farms of potohar region of Rawalpindi Pakistan, Additionally, Khanum et al. (2021) revealed that the prevalence rate in Females was 83.3% rather than 77.8% in males. According to research, females are more vulnerable than male to acquire helminths (Ekpo et al., 2010). This due to sample size and study area variation.

According to this study indicated that Ascaris galli infection found to have higher statistically significant association (P<0.05) in related to body condition score. Chicken with poor body condition were observes to have highest percentage prevalence (56%) compared to Middle (17.6%) and Good (12%). This result agrees with Ethiopian researchers who reported higher prevalence in body condition (Birhan Agmas, 2022) reported prevalence of 50% and 4.44% in poor and good body condition chickens. However, this may be associated with low nutrient intake and absorption which leads to became poor due to low immunity and highly exposed chicken infection this is due to chance of ingesting larva of Ascaris galli.

In this study, the percentage prevalence of Ascaris galli of poultry managed under extensive and intensive production system were found to be (31%) and (17.8%) respectively. Significance difference in the prevalence of Ascaris galli infection were observed between chickens under extensive and intensive production system of the study (P<0.05), Extensive production system were found to have a higher prevalence of chicken ascariasis (A.galli) compared to those managed under intensive production system, similar reports were found with high prevalence rate in extensive management system 78.54% and intensive system 33.33% by Shiferaw (2016). Abrham Ayele (2019) northwest Ethiopia reports that chickens reared under the extensive production system have prevalence of 46.9% than chicken reared under intensive 24.4%.this observe is due to their free range mode of management practice and feed widely from environment which makes them more predisposed to infection.

According this study the percentage prevalence of Ascariasis (A.galli) in chickens reared under Soil floor (traditional) and litter floor (modern) were 29% and 18.8% respectively. Statistically significant difference in the prevalence of Ascaris galli of poultry reared in Soil floor and litter flooring house (P< 0.05), slightly higher in soil floor type than floor with deep litter due to high hygiene in litter. The litter flooring system provides better manure management and reduces the risk of parasite contamination.

In this study the percentage prevalence of Ascaris galli of poultry in relation to breed assessed as to be Local (29.2%) and exotic (18.8%) chicken breed type. There is statistically significance difference in prevalence of Ascaris galli were found between chicken breed (local and exotic) (P<0.05), similar to our findings, this was higher prevalence than current study, Solomon Shiferaw (2016) revealed that the prevalence rate in local chichen was 50.26% when compared to exotic chichen 21.98% in and Around Ambowest Shoa Zone, Oromia Regional State, Ethiopia. Oc jegede (2015) reports that local chickens have higher prevalence of 44.3% than exotic chicken

40.7%. Also this result agreed with other studies conducted in Shewatatek and Birhan (2022) who reports high prevalence in local breed 22.58% than exotic breed 8.62%. Pam V.A. (2015) reported that prevalence of Ascaridia galli in local 11.40% and exotic chicken 4.60% in Nigeria. Local breed slightly higher prevalence compared to exotic chicken breed, this may be due to raising under less controlled and hygienic condition, also living free ranging in open environment can lead higher exposure to environmental contamination. Domesticated poultry or Local breed are fed broadly, which raises their susceptibility to infection, according to Frontovo (2000) and Oniye et al. (2001). Moreover, Sonaiya (1990) reports that exotic chickens are considered to be keener on food than alien birds, which can be selective eaters.

According to present study, the percentage prevalence of Hygiene was good (6.5%) and poor hygiene (50%). There highly statistically significance variation between the prevalence of chicken ascariasis (A.galli) and hygiene was observed (P<0.05), higher prevalence in poor hygiene than good hygiene, with agreement of other reports, Birhan Agmas (2015) reports that poor and good hygiene have prevalence of 39.05% and 6.12%. Chickens search for food in the soil, which is contaminated with organisms that act as intermediate hosts and infectious stages of parasites. This increases the likelihood of developing Ascaris galli or This may due to combination of environmental contamination, persistence of parasite in unhygienic area those facilitate spread of parasite through fecal-oral transmission.

In this study the percentage prevalence of Deworming was available (6.3%) and Non-available (26.4%). There statistically significance difference in prevalence of Ascaris galli and deworming in chicken was founded (P< 0.05), higher prevalence of unavailability of deworming in the owner compared to availability of deworming in the owner. This finding agreed by Birhan Agmas (2015) reports that prevalence of infection was 15.76% and 0% in non-available and available of dewormers,This may due to lack of access for dewormer for smallholder for veterinarians and lack of social awareness and commercially affordable drug for poultry ascariasis.

7. Conclusion

The study's findings, which showed that Ascaris galli parasites were present in 24% of the study area's chicken, indicate that the environmental conditions and type of poultry rearing method are conducive to the spread and persistence of parasite species. Therefore, a high infection incidence necessitates an epidemiological study to determine Ascaris galli's treatment and control approach for parasite infections. However, the study's findings led to fresh discoveries, and Ascaris galli was discovered in the study area for the first time. This parasite is regarded as one of the neglected parasites.

The prevalence of Ascaris galli in poultry was found to be significantly correlated with a number of potential risk factors, including age, body condition score, and various management systems, including intensive and extensive farming systems, floors with or without litter systems, and hygiene practices. However, there is no discernible correlation between the sex of the hens analysed throughout the study period and the prevalence of Ascaris galli in poultry.

Ascaris galli was shown to be highly prevalent in chicken farms with poor hygiene practices. Numerous possible risk factors have been identified as contributing to the occurrence of chicken ascariasis infection in the study sites. The most common causes of chicken ascariasis are these physical characteristics, the management system that includes housing, and inadequate biosecurity. Therefore, biosecurity measures should be the primary objective in avoiding and controlling Ascaris galli infection. More research is needed to identify the most prevalent ascariasis in order to have strategic control.

Recommendation

The following suggestions are sent in light of the aforesaid conclusion:

Enhance hygienic practices and sanitation procedures: Emphasise how important it is to keep hens in a hygienic and clean environment. The risk of Ascaris galli infection and environmental contamination can be reduced by keeping housing areas dry and clean, disposing of waste appropriately, and routinely picking up litter. The following factors should be taken into account to ensure proper cleanliness because the prevalence rate is high in extensive farming systems:

- Separate the infected chickens from the healthy ones.
- Avoid overcrowding and oversize flock in small area.
- Remove wet litter and proper disposal of litter to reduce transmission of infection.

ncrease Biosecurity Measures: Strengthen biosecurity protocols to prevent Ascaris galli and other parasites from entering and spreading. This may entail establishing quarantine guidelines for recently purchased birds, controlling access for guests, and following stringent guidelines for worker and equipment hygiene.

Start a Regular Deworming Program: Develop a methodical deworming program that considers the quantity of Ascaris galli present in the hen flock. Together with a veterinarian, develop a deworming program and use potent anthelmintic medications to manage the parasite.

Educate and Train: Training initiatives can help increase knowledge and encourage adherence to efficient parasite control methods. The dangers of Ascaris galli and the importance of implementing control measures should be explained to poultry breeders, farm labourers, and staff.

Research and development: Encourage more studies to determine the frequency of Ascaris galli infections and to create targeted prevention strategies. Working together with academic institutions and research organisations can help develop knowledge and innovation in the management of poultry parasites.

ETHICS

This study was approved by the University of Salaam and Somali National University Faculty of Veterinary Medicine Committee. When performing the study, the researchers safeguarded the respondents' anonymity and privacy while also taking ethical considerations into account. The unpublished data was kept private and only utilized for educational purposes. The researchers placed the utmost value on the privacy of the data and the identities of the participants. Before the researchers visited the farmers and animal owners, there was an initial phone call or in-person conversation to introduce themselves and discuss the purpose of the study. This study was carried out in strict accordance with the recommendations in the Guide for the Care and Use of Laboratory Animals of the National Institutes of Health. The protocol was approved by the Committee on the Ethics of Animal Experiments of the Somali National University and Salaam University (Protocol Number: 17-12136Som). All Laboratory Equipment was performed under Veterinary Stander Protocol, and all efforts were made to minimize suffering Poultry in the selected farms og Benadir Region Somali.

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