Study on Prevalence and Risk Factors Associated with Poultry Coccidiosis in and Around Hawassa Town, South Ethiopia

Alemayehu Negash, Abdu Mohamed and Kalkidan Wondimu

School of Veterinary Medicine, College of Agriculture and Veterinary Medicine, Jimma University, P. O. Box 307, Jimma, Ethiopia

Abstract: Coccidiosis is a major parasitic disease of poultry. It is caused by the Apicomplexa protozoal parasite of genus *Eimeria*. It seriously impairs the growth and feed utilization of infected chickens resulting in loss of productivity. Cross sectional study was conducted from November 2014 to March 2015 in Southern Nation Nationality and People’s Regional State (SNNP), Sidama Zone in and around Hawassa town, South Ethiopia. Chickens were selected randomly to determine prevalence and risk factors associated with poultry coccidiosis in selected farm and backyard rearing system. A total of 384 fecal samples were collected from *Bovans White Leg Horn* (BWLH), *Rhodo Island Red* (RIR), Mixed (hybrid) and Indigenous breeds of chickens by including both younger and adult age groups from different management system. Fecal flotation technique was performed by using saturated sodium chloride solution. Out of the total 384 fecal samples examined, 77 samples were positive for *Eimeria* oocyst giving the overall prevalence of 20.10%. The rate of 27.78% in BWLH, 9.10% in RIR, 22.62% in Mixed and 12.10% in indigenous breeds of chickens were recorded between breed of chickens and the association was statically different (P <0.05) (P=0.004, X²=13.20). The rate of infections were 27.68% in younger and 16.30% in adult age groups were also recorded between age groups and the occurrence was statically different (P < 0.05) (P=0.004, X²=8.05). On the other hand the occurrence of this poultry Coccidial diseases between management systems were also different (P < 0.05) (P=0.005, X²=10.46) with the rate of 17.20% in Backyard rearing system, 27.78% in Modern deep litter and 8.34% Modern cage management system.

In conclusions, the occurrence of this *Eimerial* disease when it occurred was more severe in BWLH breed, younger age groups of chickens and modern deep litter management system than the other. This indicates that it is an alarming the need for control and prevention measures in the BWLH, growers and modern deep litter management system. Finally some managements and control measures of poultry coccidiosis was forwarded.

Key words: Coccidiosis · *Eimeria* species · Hawassa · Oocyst · Poultry · Prevalence · SNNP · Sidama zone

INTRODUCTION

Agriculture is a corner stone system is known to possess desirable characters such economic and social life of the peoples of Ethiopia [1]. Within agriculture, livestock comprises an extremely important sector of the economy. It accounts for about 18.8% of the national GDP and 40% of the agricultural GDP [2]. The country has an estimated livestock population of 38.7 million cattle, 18.08 million sheep and 14.9 million goats [3]. Poultry is the largest livestock species worldwide [4]. Approximately 20 billion poultry exist worldwide and of this about 75% are in developing countries [5]. In Ethiopia the population of chicken, is estimated at 56.5 million [6, 7]. With regard to breed, 96.9%, 0.54% and 2.56% of the total poultry were reported to be indigenous, hybrid and exotic, respectively [2].

In most tropical countries chicken production is based mainly on scavenging production systems, which makes substantial contributions to household food security throughout the developing world [9]. In Ethiopia chicken populations are widespread and almost every rural family owns chicken, which provide a valuable source of family protein and income [10]. The majority of these chickens are maintained under a traditional system with little or no inputs for housing, feeding or
health care. The most dominant chicken types reared in this system are local ecotypes, which show a large variation in body position, color, comb type and productivity [11-14].

Recently, commercial flocks have been also emerged in urban and peri-urban areas in central parts of the country [15 & 16]. This industry occupies an important position in the provision of animal protein (meat and egg) to man and generally plays a vital role in the national economy as a revenue provider [17]. The total national annual poultry meat and eggs production is estimated at 72,300 and 78,000 metric tons, respectively and indigenous poultry contribute almost 99% of the national egg and poultry meat production [18].

With the increase of poultry production, several problems were risen which led people to refrain from investing in poultry farming for fear of mortality due to bacterial, viral and parasitic diseases [19-24]. Among the infectious diseases, Newcastle disease, salmonellosis, coccidiosis and fowl pox are considered the most important causes of mortality in local chicken while predators are an additional causes of loss [25].

Parasitism is one of the major problems which inflict heavy economic losses to the poultry in the form of retarded growth, reduced weight gain, decreased egg production, diarrhea and obstruction of intestine, poor feathers, replacement birds that take long to reach maturity, morbidity and mortality. Stress from parasites could affect the blood picture and cause anorexia [26].

Coccidiosis is one of a serious poultry parasitic disease that infects the epithelial lining of the intestines and has greatest economic impact on poultry industries worldwide Due to production losses and costs for treatment and prevention— [27, 28]. The disease is manifested clinically by intestinal hemorrhage, malabsorption, diarrhea, reduction of body weight gain due to inefficient feed utilization, impaired growth rate in broilers and reduced egg production in layers [29-31].

Poultry coccidiosis is caused by several distinct Eimeria species [32]. In many countries, nine species of Eimeria have been reported in chickens in surveys of commercial poultry farms [33] of these seven species are regarded as valid: E. acervulina, E. maxima, E. praecox, E. mitis, E. necatrix, E. tenella and E. brunetti. These Eimeria species are distinguished by: (a) The morphology of oocysts (b) their localization in the digestive tract and (c) their degree of pathogenecity [29, 30]. The disease is endemic in most of the tropical and subtropical regions where ecological and a management condition favors an all-year round development and propagation of the causal agent [31]. Its incidence is being increased in poultry due to higher stocking densities and intensive husbandry practices [32].

The disease inflicts the birds in two forms, clinical and sub-clinical forms. The clinical form of the disease manifests through prominent signs of mortality, morbidity, diarrhea or bloody feces, birds become depressed, have ruffled feathers, the wings droop and tend to huddle. The occurrence of clinical coccidiosis is directly related to the number of sporulated oocysts ingested by a bird at one time, the pathogenecity of the Eimeria species, the age of the infected chicken and the management system. Sub-clinical coccidiosis on the other hand manifests mainly by poor weight gain and reduced efficiency of feed conversion and performance and gives rise to highest proportion of the total economic losses [33].

Quantitative losses due to coccidiosis without including the sub clinical coccidiosis are estimated to be 2 billion US$ throughout the world [34, 35]. In Ethiopia is not well documented, but has reported that it contributes to 8.4% loss in profit in large scale farms and 11.86% loss in profit in small scale farms. Losses due to mortality following a severe outbreak may be devastating and incidence rates as high as 80% were observed to occur in the form of an outbreak in Ethiopia [36].

In all parts of the world poultry coccidiosis represents a major disease problem. With increasing interest in poultry production evidenced by the proliferation of poultry farms, it is pertinent to continually evaluate the prevalence, frequencies of the different Eimeria species and management issues associated with common poultry diseases such as coccidiosis in any given zone and In Ethiopia despite the immense research works done by several outstanding researchers in the area of poultry coccidiosis in different parts of the country [37-42]. The disease is still continued being a major problem demanding much research and investigation. The prevalence of this disease in and around Hawassa town, south Ethiopia was not well addressed yet though the problem is the risk of poultry producer. The objective of this to determine prevalence and risk factors associated with poultry coccidiosis in selected farm and backyard rearing system in and around Hawassa town.

**MATERIALS AND METHODS**

**Study Area:** The study area is located 07°02’22”N to 38°29’16”E at an altitude of 1,690 m above sea level (GPS reading). It is located at a distance of 275 km
The average monthly minimum and maximum temperatures were 12°C, 27.6°C and 951 mm, respectively. The wet season begins in April and extends to the end of September, while the dry season starts in October and extends to March. The entire town is spread over an area of 1,950 hectares, of which 787 ha. (40%) is developed and the remaining 1,163 ha (60%) is vacant [43]. The total population of the area is 399,461 (199,768 male and 199,693 female) [44].

Study Population: The study populations were Bovines White Leg Horn (BWLH), Rhode Island Red (RIR), Mixed (Hybrid) and indigenous breed of chicken in poultry farm of Hawassa University, Hawassa poultry farm enterprise and owned by local farmers in and around Hawassa town, Tulu and Tula town. Chickens were kept both under extensive backyard system and intensively with deep litter and cage system. In Hawassa poultry farm enterprise BWLH breed was rearing intensively in deep litter system whereas Hawassa University was rearing RIR breed in cage system. The other indigenous and mixed breeds were collected by rounding in the small holder’s owner’s home in and around Hawassa town, Tulu and Tula town. The study birds were grouped into breed (BWLH, RIR, Mixed (Hybrid) breed and indigenous), management farm type (intensive with deep litter and cage system and extensive backyard rearing system) and ages as young (2-8 weeks) and adult (above 8 weeks of age). The study was conducted from two selected poultry farm in Hawassa town, Hawassa poultry farm enterprise and Hawassa university poultry farm which 192 of the total population size of the study, from these 144 from deep litter farm system, Hawassa poultry farm enterprise and the rest 48 from cage system Hawassa university poultry farm. Another 192 from backyard rearing system of indigenous and mixed (Hybrid) breed were collected based on geographical location and easily accessibility in and around Hawassa town, Tula and Tulu town. The owners of the flock were interviewed and information about flock size, breed and management system were asked, then after representative chickens were selected and the samples were taken.

Study Design and Methods: A cross-sectional study was done from November 2014-March 2015 on randomly selected chickens to determine the prevalence of poultry coccidiosis and associated risk factor in selected two poultry farm in Hawassa town and extensively reared chicken in and around Hawassa town, Tulu and Tula town, Southern Nation Nationality and Peoples Sidama Zone, south Ethiopia. The fecal samples were collected directly from the rectum and put in plastic bottles from each chicken and brought to Parasitology laboratory of the Department of Veterinary Laboratory, Hawassa University for examination [45].
Sample Size Determination: Since the prevalence of coccidiosis in chickens in and around Hawassa town, south Ethiopia, poultry farm and extensive back yard rearing system has not been reported, 50% expected prevalence rate was used. In addition, 95% confidence interval (CI) and 5% desired absolute precision were also used [46]. Therefore, the total sample was calculated using Thrusfield formula.

\[ n = \frac{1.96^2 \times P_{exp} \times (1 - P_{exp})}{d^2} \]

where

- \( n \) = required sample size
- \( P_{exp} \) = expected prevalence
- \( d \) = required precision

The expected prevalence of coccidiosis is 50% with the required precision (d) of 5% (0.05). By substituting the value in the above formula, we get the sample size:

\[ n = \frac{1.96^2 \times 0.5 	imes (1 - 0.5)}{(0.05)^2} \]
\[ = 384 \]

Therefore, the total sample size required was 384.

Methodology: Coprological Examination: Birds fecal samples was collected per cloaca where possible or with a spatula for freshly voided feces. The fecal sample will be placed into plastic bottles, identified appropriately and transported to University of Hawassa, school of veterinary medicine, parasitological Laboratory for examination. Samples were kept in refrigerator at 4°C to be examined for coprological examination. The observation of parasitic forms in the feces was evaluated by using the Coprological flotation technique using sodium chloride (NaCl) solution as flotation medium. Gross fecal examination was done before the samples subjected to microscopic examination [47].

Data Analysis: The data which was collected from the study area, the result obtained from fecal examination was recorded in the format developed for this purpose and later on the raw data were entered and managed in Microsoft Excel worksheet and descriptive statistic was utilized to summarize the data. The point prevalence was calculated for all data by dividing positive samples by total number of examined samples and multiplied by hundred. The association between the prevalence of the disease and risk factors was assessed by Chi-square (Χ²).

A statically significant association between variables was considered to exist if the computed P value was less than 0.05. All statistical analyses were done using SPSS statistical software version 17.

RESULTS

The Overall Prevalence: The results prevalence of chickens Coccidiosis in the samples under examination in and around Hawassa town was summarized in Table 1. Out of the total 384 fecal samples of chickens examined, infections at different age, breed and management system, 77 samples were positive for coccidial oocyst giving the overall prevalence rate of 20.10%, Whereas the rest 307) were negative up on fecal examination for oocysts of coccidial parasite Table 1.

Prevalence of Coccidiosis Between Breeds: Within breed more positive result was evaluated for Eimeria oocyst up on microscopic examination in BWLH breed than the rest. A rate of 27.78% in BWLH breed, 9.10% in RIR, 22.62% in Mixed and 12.96% in indigenous breed respectively (Table 2) were evaluated. The association was statically significant P<0.05 (P=0.004, Χ²=13.20).

Prevalence of Coccidiosis Between Age Groups: Age wise prevalence of the Eimeriosis was mentioned in (Table 3), this table suggested that out of the total 384 fecal sample of chickens examined 243 samples were from adult chickens and the remaining 141 were from younger age groups. The prevalence rate is relatively higher in younger age of chickens than adult age groups, 27.66% and 15.64% in young and adult age respectively groups. The association between expected prevalence and new prevalence were significance significant P<0.05 (P=0.004, Χ²=8.05).

Prevalence of Coccidiosis Between Management System: The results of Prevalence of Coccidiosis between management system was explained in Table 4. In the deep litterfarms out of 144 fecal sample of chickens examined 40 samples were positive for coccidial oocyst with prevalence rate of 27.78%, while in cage system out of 48 fecal sample of chickens examined only 4 samples were positive and the prevalence rate of 8.34% was evaluated. From backyard home rearing system 192 fecal samples examined 33 samples were positive for chicken coccidial parasite. The association between expected prevalence and new prevalence were 10.46% and the significance between association was P<0.05(P=0.005, Χ²=10.46), (Table 5).
Table 1: The association between risk factor and occurrence of coccidial diseases

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>No of chicken examined</th>
<th>No of positive result</th>
<th>Prevalence (%)</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BWLH</td>
<td>144</td>
<td>40</td>
<td>27.78</td>
<td>13.204</td>
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<tr>
<td>RIR</td>
<td>48</td>
<td>4</td>
<td>8.3</td>
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<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>84</td>
<td>19</td>
<td>22.62</td>
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<td></td>
</tr>
<tr>
<td>Indigenous</td>
<td>108</td>
<td>14</td>
<td>12.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young</td>
<td>141</td>
<td>39</td>
<td>27.78</td>
<td>13.204</td>
<td>0.004</td>
</tr>
<tr>
<td>Adult</td>
<td>243</td>
<td>38</td>
<td>15.64</td>
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<td></td>
</tr>
<tr>
<td>Farm type</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backyard</td>
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<td>33</td>
<td>17.18</td>
<td>10.456</td>
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<tr>
<td>Deep litter</td>
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<td>27.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modern cage system</td>
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<td>8.34</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>77</td>
<td>20.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: The association between breed of chickens and occurrence of coccidial diseases

<table>
<thead>
<tr>
<th>Breed</th>
<th>No of chickens examined</th>
<th>No of positive result enumerated</th>
<th>Prevalence (%)</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIR</td>
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<td>4</td>
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<td>384</td>
<td>77</td>
<td>20.10</td>
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<td></td>
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</tbody>
</table>

Table 3: The association between age of chickens and occurrence in coccidial diseases

<table>
<thead>
<tr>
<th>Age</th>
<th>No of chickens examined</th>
<th>No of positive result</th>
<th>Prevalence (%)</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young</td>
<td>141</td>
<td>39</td>
<td>27.66</td>
<td>8.05</td>
<td>0.004</td>
</tr>
<tr>
<td>Adult</td>
<td>243</td>
<td>38</td>
<td>15.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>77</td>
<td>20.10</td>
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</tbody>
</table>

Table 4: The association between age of chickens and occurrence coccidial diseases

<table>
<thead>
<tr>
<th>Age</th>
<th>No of chickens examined</th>
<th>No of positive result</th>
<th>Prevalence (%)</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>39</td>
<td>27.66</td>
<td>8.05</td>
<td>0.004</td>
</tr>
<tr>
<td>Adult</td>
<td>243</td>
<td>38</td>
<td>16.30</td>
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<tr>
<td>Total</td>
<td>384</td>
<td>77</td>
<td>20.10</td>
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</tbody>
</table>

Table 5: The association between management system of chickens and occurrence of coccidiosis

<table>
<thead>
<tr>
<th>Farm type</th>
<th>No of chickens examined</th>
<th>No of positive result</th>
<th>Prevalence (%)</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backyard rearing system</td>
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<td>33</td>
<td>17.20</td>
<td>10.46</td>
<td>0.005</td>
</tr>
<tr>
<td>Deep litter</td>
<td>144</td>
<td>40</td>
<td>27.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modern cage system</td>
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<td></td>
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**DISCUSSION**

The overall prevalence rate of 20.10% of coccidial infection in different age, breed and management system was registered in fecal sample of the sampled chickens which further confirm the endemicity of coccidiosis in and around Hawassa town, south Ethiopia. This rate is low when compared to investigations in other countries. In previous studies, the infection rate was reported to be 54.3% in Turkey by Karaer et al. [48], 31.7% and 39.6% in India by Sharma et al. [49] and Nikam et al. [50], 36.7% and 52.9% in Nigeria by Muazu, Masdooq and Ngbede [51], 71.9% in Pakistan by Khan et al. [52], 78% in Jordan by Al-Natour et al. [53] and 92% in Romania by Gyorke et al. [54]. This result might be attributed to high stocking density and absence of intervention between flock resulting in high contamination rate of poultry house with oocyst of *Eimeria* and lack of regular disposal of litters. On the other hand, the present study chickens from different management system, age and breeds were collectively examined that is little exposure to oocyst of *Eimeria* species, low density of flocks were the resums for reduction of the rate of this diseases. The present result is in consistent with the findings of [35, 55], who assessed prevalence rates of 22.58% in deep litter system and 23.1% and 52.9% in Nigeria by Muazu, Masdooq and Ngbede [51], 71.9% in Pakistan by Khan et al. [52], 78% in Jordan by Al-Natour et al. [53] and 92% in Romania by Gyorke et al. [54]. This result might be attributed to high stocking density and absence of intervention between flock resulting in high contamination rate of poultry house with oocyst of *Eimeria* and lack of regular disposal of litters. 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Center.[57]. 19.5% in Nekemte town East Wollega, [58].) 22.58% in RIR and 12.25% Indigenous breed in Tiyo District, East Arsi Zone, [59]. 23.1% and [60]. 25.24%. This finding was disagreed with the finding of [39]. 48.80% in deep litter system. However this disagreement observed was due to the effect of environmental and management system in spite of the genotypic factor. This variation in prevalence of the disease may be due to difference in management system.

The existence of genetic variation in resistance to coccidiosis among breeds and strains has been reported by [61]. The current study also shows the rate of 27.78% in BWLH, 9.10% in RIR, 22.62% in Mixed and 22.62% in Indigenous breed was recorded among breed of chickens. In previous studies no association was found between infection rate and breed, in contrast to the present study [35, 62 and 63], e current study revealed that statically significant P<0.05 (X²=13.20, P=0.004) difference between breeds and occurrence of coccidiosis was seen. This is the fact that not only variation in genetic makeup of the chickens, but also difference in geographical location and agro ecology of the study area. The difference in prevalence among these breeds may be due to the variety of intervention and management system.

Age is one of the most principal factors in coccidiosis [63], the significant relationship was observed in agreement with other researchers [33, 51, 52, 62, 63]. Suggested that all ages of poultry are susceptible to infection but usually resolves itself around 6-8 weeks of age. It seems that the relationship between age and prevalence rate of coccidiosis is direct due to complete life cycle and the increase of oocysts consumption. The current study revealed that the prevalence of coccidiosis was higher in younger age groups, 27.66%, than in adult age groups, 15.64%, group. The difference was statically significant P<0.05 (X²=8.05, P=0.004) was observed. This finding agrees with previous reports [39,65] and also in congruent with the findings of other authors and researchers regarding the frequency of occurrence of coccidiosis with respect to the age of birds [39, 40, 65], but disagree with the record of Oljira [63] who reported the prevalence of coccidiosis was almost similar in young and adult age groups and [60] who reported the prevalence of clinical coccidiosis in adult parent stock is significantly higher than the young (1-60days). This disagreement it might be due to variation in age categories. The current finding also disagrees with the previous report by [66] who recorded a higher prevalence of coccidiosis in adult layer birds than the other age categories. During the first 6-7 weeks of age the birds picking activity increases. At this time exposure to coccidial oocyst is very high and on the other hand as the age of the bird increases the birds get immunized and resistant to the infections. Therefore, the infection rates decrease with age of the birds.

Research done in different parts of the country suggest that coccidiosis is the major health problem for chickens especially confined in the houses of deep litter system and major economic loss directly due to chicken mortality and morbidity, cost of treatment and vaccination or indirectly due to reduction in performance, reduced weight gain, feed conversion rate, for the owner of the animals. In free-ranging local chickens, non-selective picking behavior during feeding can expose chickens to infection [54]. High moisture conditions of the farm favorably influence oocyst sporulation and development to the infective stage were the potentially increase risk of coccidiosis [53, 54]. The current study also reveal that statistically significant difference P<0.05 (X²=10.46, P=0.005) between occurrence of coccidial diseases and management system of chickens. The prevalence rate of 17.19% in backyard rearing system, 8.34% modern cage system and 27.78% modern deep litter system was recorded. Coccidiosis is the most common to birds under intensive management system especially those on deep litter system due to relatively higher oocyst accumulation in the deep litter system. This finding suggests that the exposure to coccidiosis was higher in modern deep litter system than the other management system. This is the fact that in deep litter system the exposure to contaminated coccidial oocyst was high as compared to other system of management. This finding was agreed with the finding of [39] The prevalence rate of chickens that was relatively less exposed to litter was smaller than the other this is why is that, because they are manage in cage system and less exposed to the litter of the bird

CONCLUSIONS AND RECOMMENDATION

Conclusions: In support of stimulating growth, economic development, food security and alleviating poverty, the analysis of disease of poultry plays an important role in an ongoing or future development plan of the country. The result of the present study indicate that the overall prevalence rate of 20.10% were registered, this result indicates that the endemicity of this Eimerial disease in the study area. The diseases is more sever in WLHB, growers and modern deep litter management system, this is an alarming the need for control and prevention measures in the WLHB, growers and modern deep litter
management system, so management system, breed and age of chickens were the predisposing factor to coccidial disease. Infections with coccidia are often associated with severe economic losses. Based on the above conclusion the following recommendations were forwarded.

**Recommendations:** Coccidiosis is still a major burden to poultry producers and veterinary health professionals in the farm and back yard rearing system by changing its mode of occurrence from time to time as to the variation in the conditions of the management system. Hence, demanding a lot of interventions and research to develop long lasting and sustainable prevention and control strategies so as to get rid of the disease and boost the economy of the country. These principles will come out true by doing research on this disease up to species level. *Eimeria* Species should be identified in and around Hawassa town by other researcher, externship student etc.

As long as birds are reared in contact with their feces, as when they are raised on built-up litter, then coccidiosis will continue to occur. Alternative production systems might limit such contact, such as the raising of birds on wire floors or cage system, but such systems are uneconomical. If producers keep hygienic poultry house, continuously disposal of the litter and churning of the bedding it’s the best ways to control this diseases. Management system of the poultry house, litter management must be followed by the owner of the chickens.

Coccidiosis is a major economic problem for poultry producer; it is due to problems of easily accessibility of the required chickens, transportation service is costy, chemicals are scarce and so these must be fulfilled by the government, NGOs and the concerned bodies as well.

Vaccination is often promoted as the control of coccidiosis and indeed is the method of choice for the prevention of the coccidial disease. By this means, long-term, sustainable control of coccidiosis may be achieved. So continuous and sustainable anticoccidial vaccines must be given to chickens regularly at a recommended dose.

Poultry coccidiosis is a problem wherever chickens are raised under intensive and extensive conditions of poultry rearing system. This is particularly true for the high stock density of chickens, which was access to the litter contaminated by oocyst of coccidian parasite were reared together. So continuous and regular changing of bedding and litter management must be followed by the poultry farm workers farmer and management bodies of the farm.

Similar drugs were giving for long time for chickens this can leads to drugs resistance, so drug sensitivity test must be conducted in order to test the sensitivity of these *Eimeria* species and reduce financial losses.

Awareness should be created about the effect of this coccidial disease on the economy of the country by veterinary technicians’, animal health workers and all concerned bodies to the farmers, poultry farm owners and managers of the farm.

Early identifications of diseased chickens and isolations from healthy chickens were important. This activity can help reduce continuous shading of the oocyt of *Eimeria* species in dropping and contaminations of the litter. This should be followed by the concerned bodies.

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