
A Major Constraints and Health Management of Village Poultry Production in Wayu Tuka District East Wallaga Zone, Western Ethiopia

Melaku Guteta^{1*}, Gutu Terfassa²

^{1,2}Veterinary Epidemiologist, Animal Health Department, Wayu Tuka Agriculture Office, Ethiopia.

Email: ²wenditibiru2021@gmail.com

Corresponding Email: ^{1*}mguteta@ymail.com

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Abstract: *The purpose of this cross-sectional study was to identify the main obstacles and the health management system of the Wayu Tuka districts' poultry production system. The area's consenting study participants created and distributed a semi-structured questionnaire. Out of the 100 responders, 37%, 34%, and 29% were from the district's Migna Kura, Bonaya Molo, and Gute Badiya kebeles. Of the participants, 29 (29.0%) were female, while the remainder (71%) were male. The majority of participants kept at least one chicken in their houses, mostly to produce eggs and meat. In the research area, more than half of the respondents (57 percent) stated they favored the unusual varieties of chicken. Of the respondents in the study area, 44% used backyard management systems, and 56% used semi-intensive systems to manage their chickens. Regarding the frequency of cleaning the chicken buildings, half of the respondents reported doing it daily, while 36% reported cleaning them just twice a week. Most respondents claimed to have access to the marketing system and to use local shopkeepers to sell their products at doorsteps and village markets. Even though 56% and 43% of poultry owners, respectively, vaccinated and dewormed their animals, just 42% of them took care of the health and biosecurity of their chickens. In response to questions on the actions taken for the sick hens, most respondents consult veterinarians, 15% sell the sick birds, and 14% treat them with conventional medications. The research area's village poultry production faces several key obstacles, including disease and predator outbreaks, inadequate healthcare, subpar nutrition, and inadequate marketing information. Thus, in addition to hands-on instruction, ongoing training in better home design, appropriate feeding practices, and disease and predator management should be provided.*

Keywords: *Chicken Districts, Ethiopia, Poultry, Wayu Tuka.*



1. INTRODUCTION

Ethiopia is thought to be home to 56.53 million chicken's total. The bulk of poultry in the country are chicks (41.35%), followed by laying hens (32.18%) (Getachew, 2020). As a result, native chickens predominate in flock sizes and, with conventional management techniques, have a strong chance of adapting to a variety of agro-ecologies. But they are non-descriptive categories since they differ in body size, conformation, color of feathers, and other phenotypic characteristics. They can, however, withstand infections, thrive in unfavorable conditions, be well-adapted to the tropics, and outperform exotic chickens in terms of meat and egg quality (Ebsa, 2019).

Large-scale commercial poultry production systems, small-scale commercial poultry production systems, and village or backyard poultry production systems are the three main types of poultry production systems in Ethiopia (Nebiyu, 2016). The majority of rural areas in the nation use backyard chicken production systems, with the goals of producing chickens for domestic use and as a source of extra cash for the household (Obiri, 2017; FAO, 2008). Legumes, cereals, and free scavenging provide the majority of the feed for chickens; in times of feed scarcity, supplemental feed may be provided (FAO, 2008).

Feed, water, and veterinary services inputs at a medium level define a small-scale commercial production system. This production system maintains small flock sizes, typically between 50 and 500 exotic breeds, to operate on a more commercial basis, which is typical in urban and peri-urban areas across the nation. In areas with low biosecurity, birds are housed both indoors and outdoors (Adugna, 2020).

Technicians administer vaccinations against coccidiosis, Newcastle Disease (NCD), Gumboro disease, and other diseases to chickens rose on a small scale (Fitsum and Aliy, 2014). The poultry diseases are the main constraints incriminated for reduction of total numbers and compromised productivity (Natnael, 2015). It has also been shown that helminthes (Molla *et al.*, 2012), ectoparasites (Belihu *et al.*, 2009), and coccidiosis (Luu *et al.*, 2013) are among the many parasitic disorders that are quite common in Ethiopia.

A large-scale commercial poultry production system is a highly intensive system that keeps an average of 10,000 or more birds indoors with a medium to high level of biosecurity. This system is largely dependent on imported exotic breeds, which have high input needs for things like nutrition, housing, medical care, and cutting-edge management techniques. About 2% of all chickens in the country are thought to be employed in this industry. Higher productivity and complete market-oriented poultry production are the distinguishing features of this system, which is designed to meet the substantial demand for poultry in major cities. Because of improved biosecurity measures, the rate of chick mortality has dropped to just 5% (Kejela, 2019).

There are few studies, despite the fact that village chicken production significantly contributes to food security in Ethiopian rural households and some towns (Tarekegn, 2015). Only a small portion of the backyard small-scale chicken production is focused on the open market; the majority of the production is intended for domestic consumption. Generally speaking, the system only requires investments equal to the foundation stock's cost (Dessie, 2013). Chicken production and consumption provide different functions for the producer as compared to the other livestock production (Nigist and Haben, 2020). Despite all of the



challenges that chickens encounter—including the ones mentioned above—there was paucity of information in the current study area. Therefore, determining the primary barriers to poultry production in the Wayu Tuka district and evaluating the health management system of the chicken production system were the goals of the current study.

2. RELATED WORKS

2.1.Challenges in the Production of Poultry

The main obstacles to village poultry production across the nation's districts are diseases, predators, a lack of feed, a lack of exotic breeds (due to an imbalance in hatchery demands and supply), subpar housing, inadequate sanitation, market accessibility, and other factors (Assefa, 2015; Mohammed, 2016). The primary obstacles identified by the urban and village poultry production offices were inadequate transportation to offer consistent technical assistance to the poultry farmers, High expert turnover as a result of insufficient compensation and a lack of incentives to inspire urban agriculture specialists ((Ebsa, 2019; Nigist and Haben, 2020).

Numerous illnesses can affect chickens, but they can be categorized into three groups: those that can be prevented by vaccinations prescribed locally (like Newcastle); those that can be prevented or consequently treated according to a good management plan (like coccidiosis); and those that can be prevented best by good sanitation and nutrition (like cholera or coryza) (Dessie, 2013). Additionally, a variety of predators, including foxes, dogs, cats, snakes, and rodents, are the primary causes of chicken losses in the country's numerous villages, particularly while the birds are young (Asresie, 2015).

Despite having little knowledge of market circumstances, smallholder farmers are aware of how the market operates and the reasons for price fluctuations. As a result, the majority of farmers sell their hens locally. Although local consumers generally, people prefer the native birds; nevertheless, because of the massive consumption that is limited to holy days, the flock's biggest take rates occur during holidays and festivals. In these situations, prices sharply decline because of the high supply relative to the high demand (Assefa, 2015).

2.2. Health Care Mechanisms

One management practice used in village poultry production to raise chicken productivity is health care. Most farmers treat their sick chickens with feed that contains local herbs like ginger and lemon as part of their traditional treatment. Some people employ veterinarian assistance in modern medicine. Farmers using modern medicine were lower probably because of lower veterinarian accessibility and lack of awareness. It was not common practice to follow health precautions such not contaminating feed, water, or poultry buildings, which are a rise in illness conditions and poultry mortality (Asefa, 2015; Derby and Kavitha, 2016; Kejele, 2019). While some rural poultry owners vaccinate their birds against infectious bursa disease, Newcastle disease, typhoid, and chicken pox, the bulk of them do not (Tegegne, 2016).

Numerous factors affect the likelihood of disease development, including as how well litter, feed, and water are managed; how well the poultry house is cleaned; how well used litter and deceased birds are disposed of; and how well workers and equipment are protected from

biosecurity threats (Stephen, 2012). Biosecurity precautions, such as using gloves and protective clothing (boots and tutas), braking, and using the path in front of the entry are vital in the production of chicken (Yitbarek, 2016). A program aimed at educating farmers about the latest requirements for biosecurity is vital. In addition to preserving a healthy ecosystem, biosecurity will reduce infectious and zoonotic diseases (Nebiyu, 2016).

3. MATERIALS AND METHODS

3.1. Description of Study Area

The study was carried out in the East Wallaga Zone's Wayu Tuka district, in the western Ethiopian province of the Oromia Regional State. Wayu Tuka is situated in the western part of Ethiopia, 324 kilometers from Finfine, the nation's capital. In the district, there are ten rural kebele and two town kebele. Situated between latitudes 80' North and longitudes 340' East is the Wayu Tuka district. The district's entire land area is 45,339,300 km². There are two different rainy seasons in the region: the spring rainy season (April to May) and the summer rainy season (June to November). The research area got between 1400 and 2600 ml of rain and maintained a temperature of 26°C. The entire number of livestock in the Wayu Tuka area is estimated to be 268660; of that number, cattle make up approximately 99558, sheep 31896, goats 20451, chickens 98,284, horses 7320, donkeys 5398, and mules 1006 (WTAO, 2020).

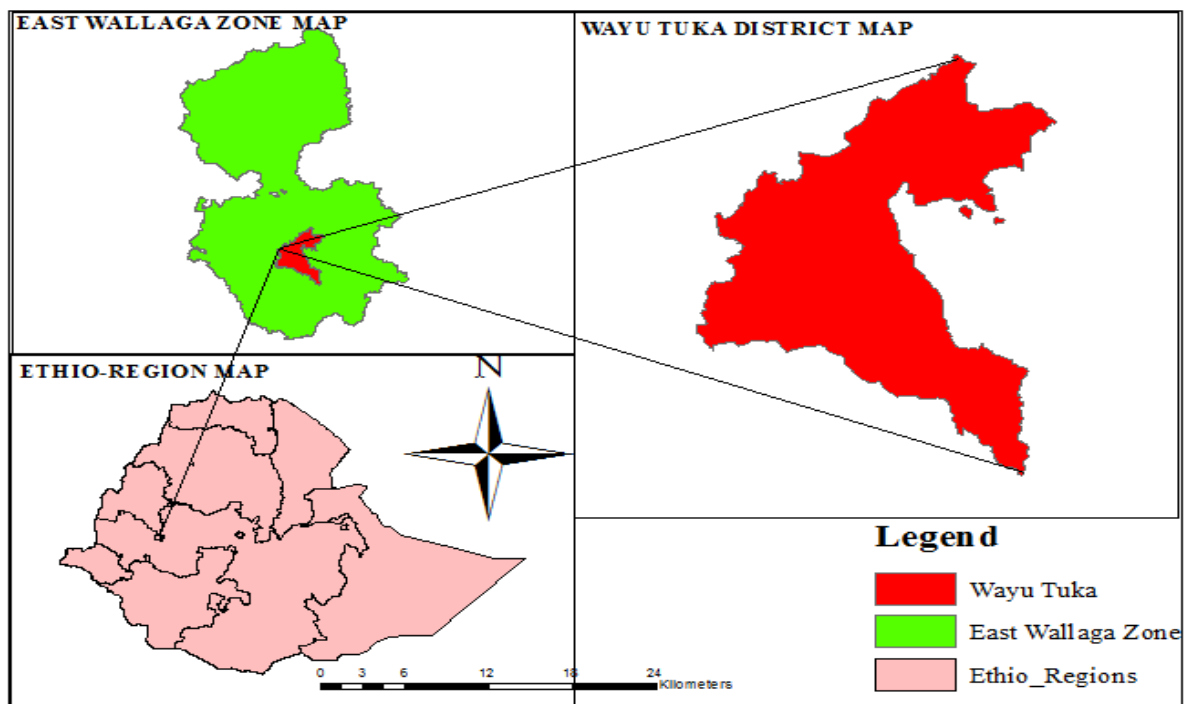


Figure 1: Map of the study area

3.2. Study Population

The study population consisted of people with various socio-demographic traits who reside in the chosen kebele of the Wayu Tuka district of the East Wallaga Zone. In this study, people of various sexes, ages, religions, and occupations are included. Additionally, people with varying levels of education are included. Additionally, specific questions about management practices and the limitations of poultry production in particular study area districts were asked of the target populations during interviews.

3.3. Study Design

Between October 2020 and June 2021, a cross-sectional study was conducted in the Wayu Tuka district of East Wallaga Zone to evaluate the management strategies and obstacles associated with poultry production. As a result, a structured questionnaire was used to gather information on the main obstacles to village poultry production in the Wayu Tuka district, including disease, health management, and feeding, housing, and other difficulties.

3.4. Sampling Method and Sampling Technique

The formula provided by Arsham (2007) was used to calculate the sample size needed for the study. Furthermore, the sample size was determined to be 100 using a 95% confidence interval (CI) and a 5% precision or accuracy level. The sample size was calculated using the formula below.

$$N = 0.25/SE^2$$

Where, N= is the required sample size,

SE= is the Standard error which is 5%.

Accordingly, simple random sampling techniques were used to select 100 study participants who were involved in the production of chickens. The three villages were given proportionate share of this size. Purposive sampling techniques were used to choose the study villages based on the area's poultry production dominance data. Only farmers willing to participate in the study and who owned hens were taken into consideration during the study period.

3.5. Method of Data Collection

Information about the farm was gathered using a prepared, structured questionnaire. Records and discussions from the farm accompanied the data gathered during the actual interview. During the interview, the questionnaire was accurately translated into the "Afan Oromo" dialect of the area. In addition, prior to the interview, they were informed of the survey's purpose and requested for their consent. The poultry production systems' production and health management systems are included in the questionnaire.

3.6. Data Management and Analysis

For statistical analysis, the survey data were imported into SPSS version-20 statistical software from a Microsoft Excel spread sheet. The data pertaining to the production and health management systems of poultry production systems were summarized using descriptive data analysis. Ultimately, a table and percentage representing the outcome were organized.

4. RESULTS

4.1. Socio-Demographic Information of the Study Participants

The questionnaire was completed by 100 people from three kebele in the study area. Megna Kura, Bonaya Molo, and Gute Badiya kebele accounted for 37%, 34%, and 29% of the total. Males made up more than half (71%) of those questioned. In terms of educational status, 14% of respondents were uneducated, and 58 (58%) of the participants had only completed high school. In terms of age groups, 44 (44%), 43 (43%), and 13 (13%), respectively, belonged to the 18–36, 36–50, and over 50 years age groups (Table 1).

Table 1: Socio-demographic characteristics of the study participants

Socio Demography	Category	Frequency	Percent
Kebele	Bonaya Molo	34	34.0
	Gute Badiya	29	29.0
	Migna Kura	37	37.0
Sex	Female	29	29.0
	Male	71	71.0
Educational status	Uneducated	14	14.0
	Elementary	28	28.0
	High schools	58	58.0
Age	18-36	44	44.0
	36-50	43	43.0
	>50	13	13.0
Living area	Urban	56	56.0
	Rural	44	44.0
Total		100	100.0

4.2. Poultry Holding Characteristics and Husbandry Practices

In the study area, 57% of respondents said they preferred exotic poultry breeds, while the remaining 28% and 15% said they preferred both local and exotic breeds. About 34%, 9%, and 4% of the respondents said they got theirs from hatching eggs naturally at home, hatchery purchases, and agriculture research centers, respectively. In the study area, 56% of respondents managed their poultry using semi-intensive systems, while the remaining 44% used backyard systems (Table 2).

Table 2: Poultry husbandry practices in the study area

Variable	Category	Frequency	Percent
Source of Poultry	Agriculture research centre	4	4.0
	Hatching of eggs naturally at home	34	34.0
	Purchased from hatchery	9	9.0
	Others	53	53.0
Breed preferred	Exotic	57	57.0
	Local	28	28.0

	Both	15	15.0
Animal management	Backyard	44	44.0
	Semi –intensive	58	58.0

4.3. Poultry Management Practices in the Study Area

In the study area, over half (56% of respondents) kept their poultry in separate houses. Conversely, 29% and 15% of the participants shared their home with other people and animals, respectively. Similarly, over half of the participants—56%—purchased feed, while 29% left their poultry alone to scavenge. Of the poultry owners surveyed, roughly 71% said they didn't know where to get extra feed for their animals. Regarding the marketing system, the majority of respondents had access to it and used neighborhood retailers to sell their goods at village markets and at their doorstep (Table 3).

Table 3: Constraints and poultry management practices in the study area

Variable	Category	Frequency	Percent
Housing Condition	Separate house	56	56.0
	Share same house with people	29	29.0
	Share with other animals	15	15.0
Frequency of house cleaning	Daily	50	50.0
	Twice a week	36	36.0
	weekly	14	14.0
Feeding system	Purchased feed	56	56.0
	Scavenging only	29	29.0
	Scavenging with supplement	15	15.0
Do you provide supplementary feed	Yes	71	71.0
	No	29	29.0
Types of feeds	Grain and Fruska	14	19.7
	Processed feed	57	80.3
Is there market access	Yes	86	86.0
	No	14	14.0
Market area of selling	Local Shopkeepers	14	16.3
	Selling at own doorstep	15	17.4
	Village market	57	66.3

4.4. Health Care Managements

Most of the respondents in the current study area were had access of veterinary extensions, and only 29% had no access to the veterinary extensions systems. However there were poor habits in the management of poultry in the current study area. Despite 56% and 43% of poultry owners take the actions of vaccinating and deworming their poultry respectively, only 42% was take on health and biosecurity actions for their poultry. Most of respondents consult veterinarians, 15% of the sell the sick poultry and the rest 14% treat with traditional medicines (Table 4).

Table 4: Health management systems of poultry in the study area

Variable	Categories	Frequency	Percent
Have you access of veterinary extensions	Yes	71	71.0
	No	29	29.0
Do you deworm your poultry	Yes	43	43.0
	No	57	57.0
Do you have practice of vaccinations	Yes	56	56%
	No	44	44
If yes types of Vaccinations	Fowl Pox	56	56%
	Others	44	44%
Do you get any training regarding to poultry health	Yes	42	42.0
	No	58	58.0
Measures taken for sick chickens	Consult veterinarians	71	71.0
	Sell them	15	15.0
	Treat with traditional medicines	14	14.0

Regarding to the constraints of poultry in the study area more than half 59% list the diseases as the common poultry constraints in the study area. Were as 29% list lack of veterinarians (Figure 2).

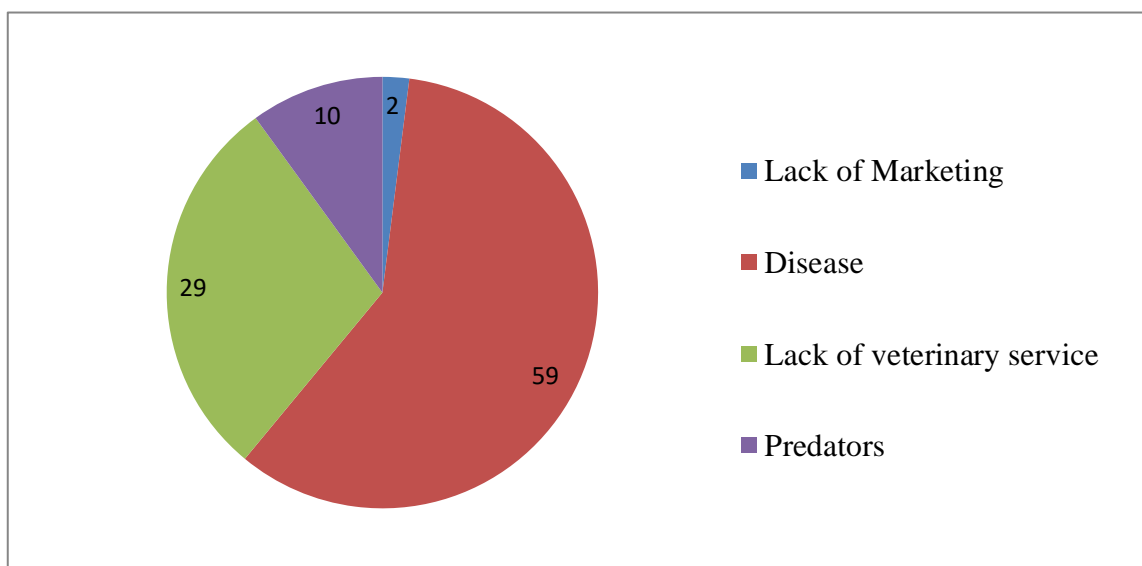


Figure 2: constraints of poultry in the study area

4.5. Seasonal Descriptions of Poultry Diseases

Among interviewed participants 15%, 15% 14% and 57% told that the proportions of chickens died were all, half, one third and quarters of the total populations respectively. Regarding to the seasons of the poultry disease occurrences in the study area more than half 57% of participants responded as it occurs commonly from the months of June to August. Whereas the rest 43% were aware as it occurs from September to November (Figure 3).

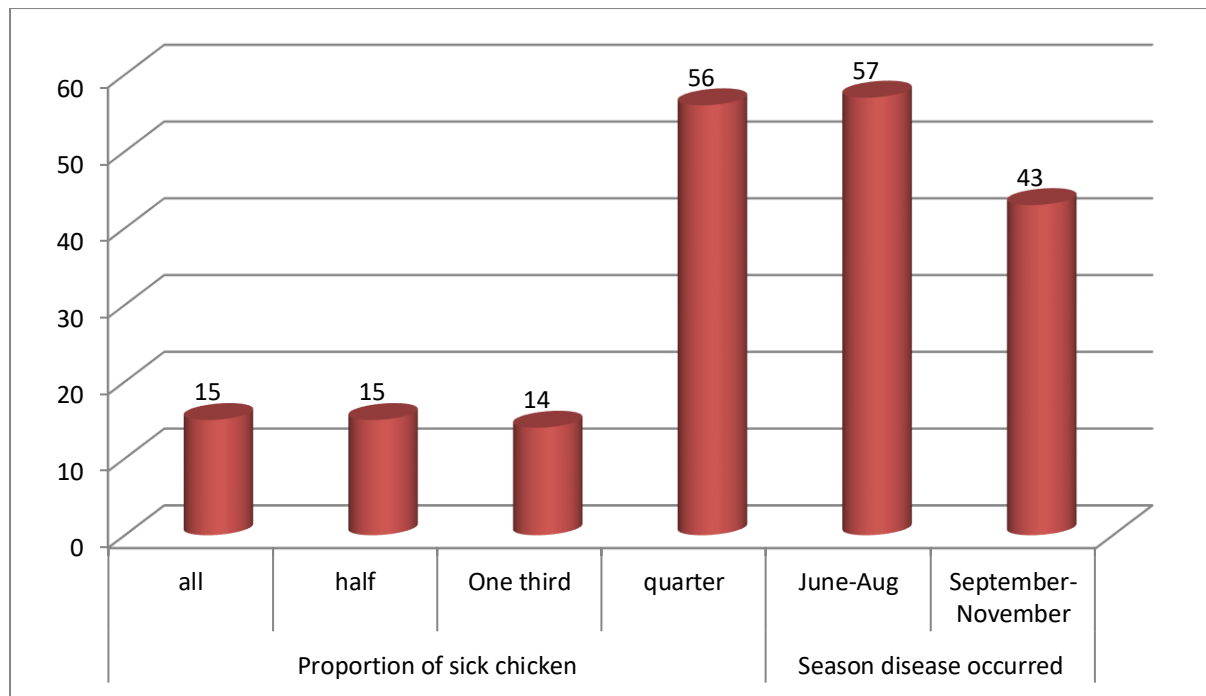


Figure 3: The seasonal descriptions of poultry disease in the study

5. DISCUSSIONS

The study found that although most respondents (58.0%) utilized a semi-intensive method, 42% of respondents employed a backyard poultry production approach. This notion validates the findings of Solomon *et al.* (2013), who came at the conclusion Rural poultry significantly improves the nutritional status, income, food security, and standard of living for many smallholders in the majority of developing nations. About 15% and 29% of participants, respectively, shared their home with animals and other people. This in line with findings of Solomon (2007), who reported a typical free-range henhouse, does not exist, and the hens coexist with humans in a family setting. According to Moges *et al.* (2010), just 22.1% of village chicken owners in the Bure district, North West Ethiopia, supplied a separate poultry house, while 77.9% of them only provided a nighttime shelter. Mengesha *et al.* (2011) conducted a study in the Jamma district of South Wollo and found that 41.3% and 21.2% of chicken owners, respectively, shared a single room and had a separate poultry house.

Regarding the frequency of cleaning the chicken buildings, half of the respondents reported doing it daily, whilst 36% reported cleaning them just twice a week. In a similar vein, 29% of participants left their chickens alone to scavenge, while 56% of people bought feed. This aligns with the conclusions of the 2009 study conducted by Fisseha, based in the northwest Amhara region of Ethiopia. The main feed sources are thought to be bug worms, seeds, and plant materials (Mekonnen, 2007).

Of the poultry owners surveyed, roughly 71% said they obtained additional feed for their animals from various sources. One of the main causes of the inadequacy in chicken production is feed resources. The results of the present study were in line with those of Gueye



(2003), who came to the conclusion that in village chicken production systems, it is challenging to estimate the economic and/or physical value of the 45% of fully recovered chickens, the 33% that partially recovered, and the 22% that did not respond due to the lack of clear techniques for assessing conventional therapy. The majority of respondents, or 67% of the scavenged feed resource, stated that all of the sick birds had died, whereas 22% of the feed supply was consumed. While grains and grain byproducts were in short supply throughout the wet season, resulting in feed shortages, the availability of supplemental feeds was recorded during the dry season (November to March) after the grain harvest (Alemayehu *et al.*, 2015). In village chicken production systems, it is difficult to estimate the economic and/or physical value of this input because there are no direct methods of estimating the scavenged feed resource which constitutes most of the feed input (Robert *et al.*, 1992).

One form of management used in village chicken production to maintain and increase productivity is health care. Just 29% of study participants in the current study area lacked access to veterinary extensions systems. All study participants had access to veterinary extensions. Just 42% of dairy owners took health and biosecurity measures for their poultry, compared to roughly 56% and 43% who vaccinated and dewormed their birds, respectively. The majority of respondents sought veterinary advice when taking action for sick chickens; 15% sold the sick birds, and the remaining 14% used conventional medicine. Similar reports were also reported by Halima (2007) from Northwest Ethiopia that most (72.43 %) farmers do not properly examine their chicken and provide no health management services. In the present survey, 44% of farmers in the study area usually treat sick chickens using traditional medicine whereas others (41%) do nothing. Only 11% of the respondents consult veterinarians when their chickens get sick; this is as a result of veterinary service insufficiency. This was agreed with the finding of Fisseha *et al.*, (2010) who indicated that the level of awareness about availability of vaccines for local chicken is low and the farmers do not have any experience of getting their chicken vaccinated against diseases.

In the current study, diseases accounted for 59% of the constraints on village poultry, lack of veterinary care for 29%, and lack of marketing for 2%. This outcome was consistent with studies by Akililu (2007), who identified the primary barriers to village poultry production as follows: Village poultry production in the study area was hindered by a number of factors, according to the farmers there: disease, lack of market, shortage of labor and feed, illness, predation, low output by local birds, neighborhood conflict, damage to gardens and crops, theft, ignorance, lack of space and housing, lack of financial capital, and influence on household health. Likewise Alemayehu *et al.*, (2015) reported the marketing system in Ethiopia is generally informal and poorly developed.

A few of the main obstacles to village poultry production in the area under study location were the presence of diseases and predators, inadequate access to healthcare, inadequate nutrition, and inadequate marketing information. The main drawbacks of the Ethiopian poultry market are the seasonal price fluctuations and the absence of a well-organized marketing system, despite the fact that chicken meat is a reasonably inexpensive and accessible source of animal protein (Mokonon, 2007). The majority of participants in the current study agreed that the market was accessible in their area. This report contradicted the findings of Mokonon (2007).



6. CONCLUSIONS AND RECOMMENDATIONS

All things considered, the current study identified several noteworthy obstacles, such as diseases and predators, insufficient healthcare, and deceptive advertising. The introduction of alien chicken breeds to replace native chickens also poses a threat to the dilution and destruction of native genetic resources. Two other factors that restrict poultry production are smallholders' lack of knowledge and their lack of capital. Despite the fact that over half of the study area's respondents kept their poultry in separate homes. Some participants live in the same home as humans and other animals. In terms of housekeeping, the chicken houses were cleaned twice a week and every day. In general, the current study area's poultry management practices were inadequate.

Therefore, based on the above conclusions the following recommendations were forwarded:

- In addition, on-going, hands-on training in areas such as building better housing, feeding practices, and disease and predator control should be provided.
- There is a need to design and implement a research programme to collect, conserve and improve the indigenous chickens in order to advance poultry production and productivity in the region.
- Lastly, it is important for chicken owners to establish a strong connection with the veterinary and extension service centre

Competing Interests

We now declare that we have no direct or indirect financial or personal interest in any topic that would contradict our obligations as the research's authors.

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