International Scholars Journals

African Journal of Poultry Farming ISSN 2375-0863 Vol. 12 (1), pp. 001-008, December, 2024. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Urban Poultry Production Techniques and the Limitations of Raising both Local and Exotic Chicks in Ethiopia's Towns of Yirgalem and Hawassa

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Accepted 30 December, 2024

Chicken rearing has a significant impact on Ethiopia's rural and urban economies. The purpose of this study was to evaluate the productive performance of both native and exotic chickens raised in the Southern Ethiopian towns of Yirgalem and Hawassa, as well as the urban poultry production system. The respondents were chosen using a stepwise purposive sampling technique, which was followed by random sampling. Based on their background in chicken production, 180 respondents in all were chosen. According to the study's findings, the majority of respondents raised their hens in backyard production systems. The majority of respondents (77.8%) raised chickens under semi-intensive and free-range management systems. While most of them give their flock water, all of the responders gave them additional grain. Additionally, the results revealed that just 38.3% of the respondents gave their flock separate homes. Diseases (coccidiosis and Newcastle) were the main factors affecting the flock in the research locations. Adaptability, particularly for exotic chickens, came in second. In comparison to rural management systems, it was determined that the study areas' chicken management systems performed well; however, more effort is still needed to improve their scientific feeding, management, and health care. Additionally, it was noted that the exotic hens significantly improved the rearers' food security and standard of living.

Key words: Constraint, exotic and local chickens, Southern Ethiopia, Urban poultry production.

INTRODUCTION

The Food insecurity is still a major issue in many regions of the world, particularly in Africa, despite regional and global economic growth. According to reports, Africa is now experiencing less urbanization than other parts of the world, and by 2050, the proportion of people living in cities is predicted to rise from 40% to 56% (Hussein et al., 2016). According to UN- HABITAT (2006) reports, between 2005 and 2030, the proportion of people living in urban areas in Sub-Saharan Africa (SSA) is predicted to rise from 30 to 47 percent of the overall population.

This will be combined with a number of significant obstacles related to the formulation of urban policy, particularly with regard to guaranteeing food security for households.

According to the results of a study by Beall and Fox (2007), the number of urban poor people will increase along with the global urban population. As the number of urban families rises, the total cost of delivering, distributing, and gaining access to food is expected to rise as well (Tschirley et al., 2015). Since practically all of them get their nutritional needs from the market, the state of the resource-challenged (urban) area is quite concerning (Thomas, 2013). Strengthening urban agriculture is therefore essential, since it can, to some extent, offer a practical way to address the severe food insecurity that is seen in many developing nations (Van Veenhuizen, 2006).

In all of these ways, raising chickens can generate extra revenue in addition to enhancing nutritional security for the most

disadvantaged groups in urban resource challenges, including expectant and nursing mothers, the elderly and disabled, growing children, and people with immune-compromising illnesses (Ruxton, 2013). According to numerous reports, chickens are the most common livestock species kept worldwide (Moreki et al., 2010). Native chickens are found in practically every rural and peri-urban area of developing nations, where they are crucial to the production of food and revenue (Moreki et al., 2010). The poultry industry's recent development in Ethiopia has brought attention to the growing significance of small and medium-sized farmers who live in urban and peri-urban regions (FAO, 2008). Although native chickens are better suited to the severe environment, they are not very good at reproducing, despite being tolerant of many diseases and good brooders.

Therefore, exotic chickens including Rhode Island Red, New Hampshire, Cornish, Australorp Light Sussex, and White and Brown Leghorns were imported to enhance the performance of the local chicken. These chickens were then crossed with local chickens (Nigussie, 2011). Since then, numerous unusual chicken breeds have been distributed to small-scale poultry producers in urban areas and rural areas by the Ministry of Agriculture, research organizations, higher education institutions, and some non-governmental organizations (NGOs) (FAO, 2008). According to reports by Dirsha (2009),

Tadesse et al. (2013), Akililu et al. (2013), Haftu (2016), and Aman et al. (2017), smallholder farmers in various regions of Ethiopia received exotic chicken varieties such Brown, Bovans Brown, Potchefstroom Koekoek, and Sasso. Despite the fact that there have been very few research on urban poultry production, its significance cannot be discounted. Seldom have studies been conducted on the limitations for various ecotypes of chickens raised in urban environments. Consequently, the study was carried out to examine the production system and restrictions in light of the backdrop mentioned above.

Many chickens in the towns of Hawassa and Yirgalem, both native and foreign.

MATERIALS AND METHODS

Description of the study area

The investigation was carried out in Yirgalem town (latitude and longitude of 6°45′N 38°25′E with an elevation of 1776 meters) and Hawassa city (7°03’ latitude North and 38°28’ longitude East at an elevation of 1708 m a.s.l). The Sidama zone in the southern Ethiopian SNNPRs region is where both sites are located (IPMS, 2005). The FAO (2007) research states that the urban area makes up 2.1% of the total regional indigenous chicken population of SNNPR, whereas the zone of Sidama, Hadiya, and Gurage together accounts for around 43.6%.

Sampling techniques and sample size

Random sampling was used after a step-by-step purposive sampling approach. Three of Hawassa's eight sub-cities were purposefully chosen based on the local chicken populations and recommendations made by the Bureau of Agriculture's officials. Purposively, two kebele and the sub-kebele within the sub-cities were chosen based on the number of chickens. Additionally, the respondents were chosen based on their willingness to participate in the study and their background in chicken farming. For the survey, 180 respondents, or 20% of the identifiable individuals, were chosen at random (Kish, 1965). The four kebeles were purposefully chosen using the aforementioned criteria, even though Yirgalem town contains nine kebeles. It was also purposefully discovered that those who own both indigenous and exotic breeds of chickens have five or more of them among the chosen kebeles.

Data collection procedure

There were semi-structured questions throughout the study. In order to collect data about poultry production systems, opportunities, and restrictions, the questionnaire was pretested before being given to traditional poultry rearers and a chosen group of poultry owners.

Statistical analysis

SPSS version 16 was used to evaluate the quantitative and qualitative data gathered from the study of urban poultry production systems (SPSS, 2007). The Duncan Multiple Range Test (Duncan, 1995) was used to compare the means of the quantitative features, and two-way ANOVA was employed to compare the data across the two study locations. The Chi-square test was used to compare the values pertaining to the qualitative qualities. At the 5% level, the values were deemed significant. Using the following method, a priority index was also utilized to rank the potential for urban poultry production based on their relative relevance and the restrictions based on their severity:

Priority index = (F1*4) + (F2*+3) + (F3*2) + (F4*1)/Ftotal
F1= Frequency of the first rank;
F2= Frequency of second
rank; F3 = Frequency of third
rank; F4= Frequency of fourth
rank;
FT= Frequency of total respondents.

Table 1. Experience, breed type and sources of chicken in the study areas.

Variable	No. of respondents	Percent	(χ^2<0.05)
Average years you have reared chicken (Mean±SD.)	180	8.23±2.24	
Breed types of chickens (%)			
Local	50	27.8	
Sasso	61	33.9	
Bovans Brown	29	16.1	
Local and Bovans Brown	7	3.9	
Local and Sasso	28	15.6	
Sasso and Bovans Brown	2	1.1	
Sasso and Koekoek	3	1.7	
Source of the exotic chicken (%) (N=130)			
Government extension	105	58.3	**0.005**
Market	69	38.3	
Relative	6	3.3	
Age of the exotic chicken while start rear (%) (N=180)			**0.003**
Starter (0-8wks)	96	53.3	
Layer/hen	34	18.9	
Have no exotic chicken	50	27.8	

RESULTS AND DISCUSSION

In the study areas, experience, chicken type, and chicken source

The majority of respondents in the research area have extensive expertise raising chickens, according to Table 1's results. The results also show that, in addition to the local ecotypes, the three most common ecotypes of chickens are Sasso, Bovans Brown, and Koekoek. The findings also demonstrate that the respondents obtained the exotic ecotypes via local marketplaces after receiving them from government entities. According to this finding, the majority of respondents raise baby cockerels or pullets, although a small percentage have purchased mature hens.

The outcomes of the chicken rearing experience (Table 1) in the research locations are comparable to those reported by Nebiyu (2016) and Melese and Melkamu (2014). According to Alemayehu (2017), expertise with livestock rearing is crucial for enhancing husbandry techniques since it makes the rearers more knowledgeable about illness signs, feeding requirements, and watering requirements in addition to managing egg storage and incubation. The respondents' sources and the age at which they began growing their exotic chickens showed a highly significant difference (P<0.05). This outcome is comparable to that of Aman et al. (2017), who found that the majority of village chicken owners in Kambata Tambaro zone and Wolaita zone purchased pullets from local cooperatives and private farms, although others obtained them from government agencies. Purchasing pullets instead of day-old chicks reduces the risk of disease or parasite-related mortality (Abraham and Yayneshet, 2010). If the pullets are purchased from the Bureau of Agriculture or non-governmental organizations, they can be guaranteed to have had vaccinations against the major diseases that are prevalent in the region, which will improve their growth and reduce their death rate (Hawassa BoLF, 2016; Yirgalem BoLF, 2016).

Chicken production system in study areas

Table 2 displays the findings on the husbandry procedures used for the hens raised in the research areas. According to the table's results, the majority of respondents raised their hens in conventional or scavenging settings without adequate housing or management. This result is consistent with Mekonnen's (2007) observations. There are benefits and drawbacks to the backyard poultry rearing technique. The former is that it considerably lowers feeding costs because it uses leftovers and home grain (FAO, 2007). Aside from the fact that they might not be able to have a balanced diet, the hens' exposure to numerous illnesses and parasites is a drawback (Alemayehu, 2017). The feed supply in the home chicken production system might not be consistent throughout the year (Ravindran, 2013).

Table 2. Production and management system, and feed source of chicken in the study areas (N=180).

Variable	Location		Total	(χ^2<0.05)
	Hw	Yr		
Production system (%)				**1.000**
Traditional/backyard	97.8	97.8	97.8	
Small-scale commercial	2.2	2.2	2.2	
Management practice (%)				**0.150**
Free range (scavenging)	16.7	26.7	21.7	
Indoor rearing (intensive)	0	1.1	0.6	
Scavenging and indoor	83.3	72.2	77.8	
Source of feed (%)				**0.000**
Commercial feed	16.7	2.2	9.4	
Scavenging and supplementary feeds	24.4	3.3	13.9	
Scavenging and home by-product	14.4	26.7	20.6	
Home by-product, scavenging and supplementary feeds	44.4	67.8	56.1	

Hw = Hawassa, Yr = Yirgalem.

Because the percentage is now relatively low, the respondents must be educated about scientific poultry husbandry procedures, such as housing and feeding. The significance of contemporary poultry husbandry techniques, which can boost the hens' productivity and the venture's profitability, must be evaluated by the respondents (Moges et al., 2010).

Chicken management techniques in the research domains

According to this data, the majority of respondents (77.8%) confined their chickens indoors after twilight but let them scavenge throughout the day. This might be done to shield the hens from predatory attacks and the whims of nature. According to the remaining responses, they either raised the hens in confinement or in free conditions. The outcome supports the findings of Srinath (2009), who stated that the research area's chickens are raised in a semi-intensive manner, with the hens being confined at night in a gated area. While Ravindran (2013) noted that scavenging management systems do not have year-round access to feed, Zelnter and Maurer's (2009) study suggests that laying hens in scavenging systems may exhibit advantageous behavioral traits that are not achievable in poultry houses. The values derived from the current research, however, are greater than those found in the Wolaita and Kambata Tambaro zones by Aman et al. (2017). Additionally, Emebet (2015) found that a small percentage of South-West farmers (28.45%) handle their chickens in a semi-extensive manner.

Ethiopia's Showa and Gurage.

Chicken diets and feeding practices in the research areas

According to this finding, the majority of respondents feed the hens leftover food and feed additives. In addition to scavenging and supplemental feeds like maize, wheat, wheat bran (Frushika), and kinche (broken grains), the feedstuffs included home by-products or food leftovers (injera, bread, kocho, and vegetables). However, some respondents (20.6%) also stated that they only give their hens leftover food and rely on scavenging; for other respondents, scavenging is the only source of nourishment for their chickens. In the research locations, there was a highly significant difference (P<0.05) in the chicken feed sources.

The results show that the respondents supply some additional feed in addition to food left over and scavenging, which is a sign of improved feeding management. Supplementary feed can guarantee increased bird productivity and capability for reproduction (Gezahegn et al., 2016). The additional foods given to the chickens in the research regions are consistent with findings made by Wondu et al. (2013) in Ethiopia's Northern Gondar. The respondents' increased awareness and understanding of the significance of supplemental feeds can be linked to the supply of such feeds (Alemayehu, 2017). However, the findings indicate that the additional meals provided for the study's chicken locations with low protein content and high energy content (Alemayehu, 2017). An imbalance between the energy and protein forms of feed is undesirable because it hinders the use of both. For example, a high energy feed will result in lower feed intake, which will lower the quality and performance of egg production (Nebiyu, 2016).

Watering system of the chicken in the study areas

The results also show that 95.6% of the respondents provide their hens water. In addition to supplying water adlib (86.1%), this shows that they are concerned about giving their flocks water, which is a sign of good husbandry practices. Although some of the respondents also mentioned that they did not take care to provide their flocks water, the percentage was too small, thus they must be educated on the use of water as a nutrient. The findings on the chickens' access to water are consistent with those of Desalew (2012), who observed this in Ethiopia's East Shewa. One of the most crucial but often overlooked nutrients is water; for the chickens' overall productivity to increase, the amount and quality of water they have access to must be at their ideal levels (Ravindran, 2013). The current results (of adlib water provision) are consistent with Dirsha's (2009) and Desalew's (2012) observations.

Meseret (2010) did note, however, that water is available at specific periods of the day. Both positive and negative outcomes are possible; the former is associated with cleanliness, while the latter is associated with welfare concerns (Van Horne and Achterbosch, 2008).

Housing system of the chicken in the study areas

This result demonstrates how common housing management is among the chicken farmers in the research regions. According to the survey, raising chickens in the kitchen was the most popular way to keep them (45.6%); some respondents (38.3%) built separate housing for the birds as a result. With a larger observation value than Addisu et al. (2013), who found that only 20.92% of the birds in North Wollo, Amhara area, were perched within kitchens, this study further demonstrates that many of the respondents keep their chickens in their kitchens. According to Bailey and Larson (2013), keeping hens in their owners' homes may have negative effects, including the spread of parasites and illnesses. The owners must therefore be informed of the effects of such housing. The findings also reveal that a large percentage of respondents (38.3%) provide their flock individual homes, which is a healthy husbandry practice as long as the house is kept up and cleaned on a regular basis. The study is comparable to the Ayalew and Adane's (2013) findings.

Health management of chicken in the study areas

This outcome demonstrates that the conversation with the town's veterinary health care specialists revealed that the research region had a chicken health issue, with Newcastle being the most common disease. Coccidiosis, particularly during the high rainy season, was the second most significant disease in the study locations, followed by ectoparasites. These factors contributed to the majority of respondents in the areas (56.1%) practicing culling or 43.6% using culling as a significant preventative measure for their chickens. There was a difference ($P<0.05$) in the research locations regarding the rationale behind the culling of chickens. The majority of responders mentioned culling birds that had illnesses, which is consistent with Desalew's (2012) findings. This helps recover losses during disease outbreaks, but it can also have negative effects by facilitating the transmission of infections to disease-free areas. According to Getu and Birhanu (2014), the disease is not caused by the study regions' own flock but rather by entering chicken in the Northern Gonder, Amhara region. Therefore, the government should make sure that the birds' movement—whether through traders or otherwise—is stopped in such cases. The dead birds should be disposed of appropriately, and their carcasses should not be eaten by carnivores or other animals or birds (Bailey and Larson, 2013).

Both contemporary and traditional veterinary medications are used by the research areas' respondents. Common floral medicines, including feto (Brassica spp.), lemon (Citrus), red pepper (Capsium spp.), and nech shinkurit (Allium sativum), were soaked in or fed to the chickens as part of their ethnoveterinary medicine regimen. The respondents' reported use of floral medicines was comparable to what Wondu et al. (2013) found in Northen Gonder's metropolitan regions. According to comparable authors, the local responders also drank Areke, a local beverage, and Grawa, a Vernonea amygdalon. The popularity of ethnoveterinary medications from Sidama province's rural areas was also noted by Feleke et al. (2015). The respondents' attitudes on traditional medicines may be the reason for their availability (Roberts, 1971).

Possibilities and limitations associated with the system of chicken production and marketing in the research regions

The opportunities for raising hens in the research areas are shown in Table 3, with the main ones being market accessibility, followed by feed (at Yirgalem) and veterinary care (at Hawassa).

Table 3. Opportunities for chicken production in the study areas (rank and index) (N=180).

Variable	Opportunities for Hawassa		Opportunities for Yigralem	
	PI	Rank	PI	Rank
Market access	0.48	1st	0.46	1st
Feed access	0.13	4th	0.26	2nd
Extension service	0.16	3rd	0.15	3rd
Veterinary service	0.23	2nd	0.13	4th
Total	**1.00**		**1.00**	

Priority index = (F1*4) + (F2*3) + (F3*2) + (F4*1) divided by the sum of all counted values mentioned by the respondents.

Table 4. Constraints for chicken production in the study area (rank and index) (N=180).

Variable	Constraints for Hawassa		Constraints for Yigralem	
	PI	Rank	PI	Rank
Lack of feed	0.102	4th		
Disease	0.32	1st	0.27	1st
Poor adaptability	0.31	2nd	0.25	2nd
Market	0.07	5th	0.15	4th
Awareness how to manage the chickens	0.198	3rd	0.22	3rd
Lack of improved breeds			0.11	5th
Total	**1.00**		**1.00**	

Priority index = (F1*5) + (F2*4) + (F3*3) + (F4*2) + (F5*1) divided by the sum of all counted values mentioned by the respondents.

The findings regarding the main opportunities associated with the two locations under study (Table 3) show that the respondents found the opportunities to be very encouraging, particularly those that took into consideration the availability of feeds, marketing, and veterinary and extension services. These results are consistent with those of Nebiyu (2016). The availability of an all-weather market is desirable since in many regions of the nation, which are mostly populated by Orthodox Christians, the market is seasonal (Ayalew and Adane, 2013; Emebet, 2016). As a result, it is anticipated that small business owners, the unemployed, and educated people will be able to make a living from raising chickens. With a small variation in their ranking, the opportunities at Yirgalem are also fairly comparable. This suggests that there is room for improvement in veterinary care, which is one of the current factors ensuring the profitability of chicken farming, and it is consistent with the findings of (Feleke et al., 2015; Nebiyu, 2016).

According to the results shown in Table 4, the main obstacle to raising hens in the study locations is the prevalence of the disease, which is followed by adaptability (particularly for exotic chickens). These factors led the majority of study region respondents to favor raising solely domestic hens. The findings in Table 4 show that the restrictions on raising hens in the two research regions are comparable with

Wondu et al. (2013) found. Aman et al. (2017) also found that disease and feed shortage were the main obstacles to chicken production in the study districts of the Wolaitta zone and Kambata Tambaro zone.

In addition to obtaining financial facilities from banks or microfinance institutions (MFIs), it would be preferable for the respondents in both areas to establish cooperatives or self-help groups (SHGs) that might assist them in obtaining feed (in bulk) from the factories (Ban et al., 2015). In addition to helping with egg marketing, the establishment of such institutes can aid in setting up training programs, which can serve to improve the methods used in chicken husbandry in the research areas. Varathan et al. (2012) have documented the significance of SHGs and cooperatives in enhancing livestock husbandry methods and marketing livestock products.

CONCLUSION AND RECOMMENDATION

The findings of the current study on the limitations and urban poultry production practices in two Southern Ethiopian towns. According to this survey, the majority of the households engaged in both indoor management and scavenging, with only a small percentage offering basic amenities including adequate housing and a healthy diet. In the research area, chickens are raised first for domestic consumption and then for commercial purposes. In addition to scavenging, the hens were given other meals, and they were given water on demand. Coccidiosis and new castle diseases posed a serious risk to the venture's profitability. The following suggestions were sent out in light of the aforementioned conclusion:

(i) To produce more in a smaller area, the cage system is more important in urban poultry production than backyard farming. Additionally, because it helps to avoid diseases like coccidiosis and endoparasites, it may improve the flock's hygienic conditions.

(ii) By using locally accessible materials, the chicken's diet and feeding method should be adjusted. (iii) Universities and research stations must perform government extension work and regular refresher courses to better teach the development for study area and evaluate the rearers about the management of exotic chickens. (iv) In order to provide widespread vaccination against the main poultry diseases in the research areas, the government should raise community awareness about chicken vaccination.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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