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# Demonstration and Evaluation of Lohmann Brown Chicken Breed Under Small Scale Farmers Condition at Hawassa Zuria Woreda Sidama Region

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**Abstract:** The study was conducted at Threekebeles namely Tenkaka, Umbulowacho and Kajima kebele in Hawassa Zuria woreda, Sidama Regional state, Ethiopia with the objective of to increase improved poultry breeds option to resource small scale farmers' condition in the region by demonstration and evaluating production performance of Lohman Layers breed. Thirty (30) Participant farmers were selected purposively from three kebeles (10 farmers from each kebele) on the basis of willingness to construct poultry house; to cover all the associated package costs and record the required data. Under each household 30 pullets of Lohmann brown chicken were distributed that purchased from Debre Zeyt poultry Multiplication and Dissemination center. Before the distribution of pullets training was given for those farmers about general management and husbandry of breeds essential data like body weight at monthly basis, mortality and cause of mortality, age at the start of egg lay, body weight at the start of egg lay, weight of egg at the egg lay start has been collected and spread out on the Microsoft office excel 2007. SPSS (version 20.0) was used to analyze data. The survivability of chickens under farmer's level averagely 89.3% up to the age of 22th week or on set of egg lay observed. On averagely 2.8% mortality rate was occurred at 12<sup>th</sup> and the main causes of mortality was the disease and predatory. Generally 10.7% mortality rate or 89.3% survival rate was observed in this study. The average weight gain also recorded using sensitive balance to evaluate growth performance. As a result, there was increasing trend of weight gain starting from initial to onset of egg production. So, maximum average body weight gain of Lohmann brown chickens was 1.32 kg at 22<sup>nd</sup> week. Similarly, average egg weight has been increased averagely 54.1 gm around 22<sup>nd</sup> week of age. Finally, the Lohmann Brown chickens in all aspects of production and productivity were feasible to enhance family nutrition and income generating aspects, as a result has indicated on this study at Hawassa Zuria Woreda or mid land area and the same investigation should be done in other ecologies specially high and low lands of the region.

**Keywords:** Lohmann, Brown, Tenkaka, Umbulowacho, Kajima, Hawassa Zuria

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## 1. Introduction

In Ethiopia, the overall standard of poultry husbandry is mainly scavenging type and usually poor [9] because of the low level of inputs and in addition, there are a considerable number of constraints to village poultry production [21]. A range of factors such as suboptimal management, lack of supplementary feed, low genetic potential and high mortality rate are the major causes for the apparent low output level

The productivity of village chicken production systems in general and the free range system in particular is low [12]. This is due to low egg production and high mortality rate [14, 24, 1] also characterized the low productivity of local chicken due to low egg production performance, production of small sized eggs, slow growth rate, late maturity, small clutch size, an instinctive inclination to broodiness and high mortality of chicks [22]. Farmers are reluctant to increase their level of inputs into local chicken production due to the

high mortality normally encountered in their flocks [19, 20]. The fertility of layers and hatchability are satisfactory as each hen usually hatches about 8 to 12 chickens, however on average only 2 to 4 chickens from each clutch raised to maturity [5]. There are many constraints that have to be solved in order to increase survivability and production of local chickens [11]. A recent study on adoption of poultry breeds in the region also indicated that adoption has been limited by a set of factors such as, lack of strong extension follow up and complimentary inputs, diseases, unavailability of credit services and market problems [3]. Besides, the access and availability of improved breed option to the farmer were limited or few [9]. This results to a huge gap between demand and supply of poultry products. To increase the availability and access to improved chicken breed option to the farmers', different approaches and improved poultry technology packages should be introduced and adapted based on certain socio-economic and physical environments. Therefore, ORTDP project has proposed to introduce and evaluate the adaptability and production performance of new breed (*Lohmann breed layers*) in HawassaZuriaworeda of the region with the objectives of to increase improved poultry breeds option to resource small scalefarmers'condition in the region by demonstration and evaluating production performance of Lohman Layers breed.

## 2. Materials and Methods

### 2.1. Description of Study Area

The study was conducted at Hawassa Zuria woreda located Sidama Regional State of Ethiopia. Geographically it is located between 7.5° - 7.8° N latitude and between 38.18°-38.25° E longitudes. The elevation area is ranges from 1680m to 2100m above sea level (a.s.l). Areas receive annual rain fall of 1244 mm on a bimodal distribution and mean annual temperature varies between 18 and 28 degree Celsius.

### 2.2. Selection of Farmers

Hawassa Zuria woreda is one of woreda that has been supported by Operational Research Technology Dissemination project (ORTDP). Due to this, the woreda was selected to demonstrate Lohmann layer chicken breed. Three kebeles namely Tenkaka, Umbulowacho and Kajima had been selected purposively based on potential on poultry production, and road accessibility for the follow up. Thirty farmers that meanstfarmers from each kebele had been selected purposively by their willingness to carry out all challenges, experience of poultry production and ability to record necessary data.

### 2.3. House Construction and Preparation

Intensive training had given for Farmers on poultry house construction and general management of chicken before the commencement of intervention. Then farmers constructed house as they have been trained. Feeder and waterers were prepared by farmers before the introduction of chickens.

Chicken distribution and management of Lohmann pullet has been purchased from Debrezeyt poultry farm. Each household was given 30 birds with commercial pullets' feed. Birds fed commercial pullets' feed till the start of egg production and formulated locally available layers feed then after. Intensive follow up was done by DAs, woreda experts and researchers and technical assistants of Hawassa Agricultural Research Center.

### 2.4. Chicken Distribution and Management

A pullet of Lohmanns brown layers has been purchased from Debre Zeyit poultry distribution center. Each household was given 30 birds with commercial pullets' feed. Birds fed commercial pullets' feed till the start of egg production and formulated locally available layers feed then after. Intensive follow up was done by DAs, woreda experts and researchers and technical assistants of Hawassa Agricultural Research center.

### 2.5. Data Collection and Management

#### 2.5.1. Data Collection

Data on the body weight at monthly basis, mortality and cause of mortality, age at the start of egg lay, body weight at the start of egg lay, weight of egg at the egg lay start and peak production period and laying ability has been taken by respective researchers and technical assistants of Hawassa Agricultural Research Center.

#### 2.5.2. Data Management

All collected data was spread out on the Microsoft office excel 2007. SPSS (version 20.0) was used to analyze data. Cross-cutting issues: The project realizes participation of women farmers and increases nutritional value and income of households.

## 3. Beneficiaries and Location

Five women headed household were selected in each kebele. Farmers were selected based on their willingness to construct poultry house or those who had house access, interest to rear the exotic chickens, ability to manage the breeds well and up-come all related challenges, enough time for chickens, to cover the necessary package costs and ability to record the required data. In 2018/19, more than 2400-day-old chickens have been proposed to adapt and evaluate the production performance on 30 women headed household in Tenkaka, Umbulowacho and Kajima of HawassaZuriawith feed and vaccine package supply. About 400 household expected to be benefited from indirect technology and knowledge transfer.

## 4. Results and Discussion

### 4.1. Mortality and Survivalists of Birds

As shown in the Table 1 below, the highest mortality rate of Lohman Brown layer chicken breed was recorded at the

first eight weeks of the introduction (3.3%) in contrast 39.35% of mortality rate was recorded on the same breed [13]. The reason for that death was the disease and predator which means twelve was dead by diarrhea and other by predator so called wild cat. Overall mortality of Lohman brown chicken breed at Hawassa Zuria woreda was recorded as 10.7% until the start of egg production. The result recorded in the current study in On-farm evaluation is disagreed with the result of [18] who reported about 54.85% mortality rate at the farm household condition on Fayoumi Chicken Breed. On the other way survivality of Lohmann Brown chicken breed was high (89.3%) start from the pullet to egg production at Hawassa Zuria area. This indicates that survivality of Lohmann brown chicken breed at mid land showed a promising result to enhance production and productivity. Higher result was also obtained (94%) survivality of bovans brown chicken breed was around Dessie town Amhara National Regional state [19].

#### 4.2. Age, Body Weight and Egg Weight of Birds

Present study revealed that average age of Lohmann Brown chicken breed at the onset of egg production was 21.1

weeks. This result had some difference with the report of [8] who have reported an average age at the onset of egg production of koekoek and Bovans Brown chicken breed as 27.4 weeks. But, the report of [6] on commercial laying hens showed earlier average age at-first-of lay to be 18 week and according to [16] commercial egg type layers started laying eggs at the age of 20-21 weeks and produced 277 eggs till 72 week of their production cycle. Average body weight of birds at the onset of egg production was 1.316 kg. This was higher compared with the results 0.930 kg for supplemented and 0.783 kg for non supplemented bovines brovine chicken breed Whereas 1.9 kg of average body weight reported by [23]. Average egg weight of Lohmann Brown chicken breed at present study was recorded as 54.09 gram. This was higher result when compared with 53.3 gram of egg weight which was presented by [8] on the Bovans brown breed at Amhara region Dessie area. Compared to previous study this result is lower than 55.7g an average egg weight values of Potchefstroom Koekoek reported by [15] South Africa and similarly 63.5g obtained from the guideline published by the company and 63.9g reported by [4] for the Bovans Brown breed.

Table 1. Mortality and survivality of chicken.

HH№	Birds given	No of birds at 4 <sup>th</sup> wk	Mortality rate (%)	No of birds at 8 <sup>th</sup> wk	Mortality rate (%)	No of birds at 12 <sup>th</sup> wk	Mortality rate (%)	No of birds at 16 <sup>th</sup> wk	Mortality rate (%)	No of birds at 20 <sup>th</sup> wk	Mortality rate (%)
1	30	29	3.3	28	6.6	26	13.3	26	13.3	26	13.3
2	30	27	10	27	10	27	10	25	16.7	25	16.7
3	30	30	0	26	13.3	24	20	24	20.0	24	20.0
4	30	30	0	30	0	28	6.7	27	10.0	26	13.3
5	30	30	0	28	6.6	28	6.7	24	20.0	26	13.3
6	30	28	6.7	28	6.6	28	6.7	28	6.7	27	10.0
7	30	30	0	30	0	27	10.0	26	13.3	25	16.7
8	30	29	3.3	28	6.6	27	10.0	27	10.0	26	13.3
9	30	30	0	29	3.3	29	3.3	29	3.3	29	3.3
10	30	30	0	30	0	28	6.7	27	10	24	20.0
11	30	30	0	29	3.3	29	3.3	28	6.7	28	6.7
12	30	29	3.3	27	10	27	10.0	26	13.3	26	13.3
13	30	27	10	27	10	27	10.0	27	10.0	27	10.0
14	30	30	0	28	6.6	25	16.7	25	16.7	23	23.3
15	30	30	0	29	3.3	29	3.3	29	3.3	29	3.3
16	30	30	0	28	6.6	25	16.7	25	16.7	25	16.7
17	30	29	3.3	28	6.6	28	6.7	26	13.3	26	13.3
18	30	29	3.3	26	13.3	26	13.3	26	13.3	26	13.3
19	30	30	0	30	0	30	0.0	30	0.0	30	0.0
20	30	30	0	29	3.3	29	3.3	29	3.3	29	3.3
21	30	30	0	30	0	30	0.0	30	0.0	30	0.0
22	30	30	0	30	0	28	6.7	27	10.0	27	10.0
23	30	30	0	30	0	30	0.0	30	0.0	30	0.0
24	30	30	0	28	6.6	25	16.7	25	16.7	24	20.0
25	30	30	0	30	0	29	3.3	29	3.3	29	3.3
26	30	30	0	30	0	30	0.0	26	13.3	26	13.3
27	30	29	3.3	30	0	30	0.0	30	0.0	30	0.0
28	30	29	3.3	29	3.3	29	3.3	29	3.3	29	3.3
29	30	30	0	30	0	30	0.0	30	0.0	30	0.0
30	30	30	0	26	13.3	26	13.3	26	13.3	26	13.3
Total	900	885	1.6%	858	3.3%	834	2.8%	816	2.1%	808	0.9

HH: House Hold, №: Number.

**Table 2.** Age, average body weight and average egg weight of birds at first egg lay.

HH. №	Average age of birds at egg onset (in week)	Average body weight of birds at egg onset (kg)	Average egg weight (g)
1	22	1.32	54.1
2	20	1.25	60.7
3	21	1.24	53.4
4	21	1.33	50.8
5	20	1.5	51.6
6	22	1.4	55.01
7	23	1.3	50.9
8	22	1.32	51.3
9	20	1.4	58.4
10	22	1.27	59.1
11	20	1.12	53.1
12	23	1.25	52.6
13	20	1.25	50.5
14	22	1.6	56.6
15	20	1.39	57.3
16	20	1.5	52.1
17	20	1.36	55.9
18	23	1.23	50
19	20	1.09	56.4
20	20	1.18	50.7
21	21	1.2	53.8
22	21	1.23	58
23	22	1.51	50.9
24	21	1.26	51.6
25	22	1.42	54.2
26	20	1.15	58
27	21	1.23	54
28	20	1.3	51.1
29	24	1.14	50.6
30	20	1.58	60.04
Average	21.1	1.31	54.09

HH: House Hold, №: Number.

#### 4.3. Perception of Farmer's

Farmers were pleased by the breed and decided to improve poultry production system. According to the producers the breed has paramount merit than any other chicken breeds they know before. Some of the merits mentioned by the participants were; better egg production, good medium body size, ability to resist disease, able to rear year round and rear as side activity.

**Table 3.** Farmers perception of birds at the study area.

Characters	Number of respondents	Response (%)
Eggs production	30	100
Disease resistant	30	100
Able to rear year round	30	100
Medium body size	30	100
Rapid sexual maturity	30	100

#### 4.4. Constraints of Chickens Production as Mentioned by Producers

Recent study shows that feed shortage, disease and predator were economically important challenges in the study area. Similarly [7] reported that disease was major economically important challenge for village chicken production system. Predation is one of the major economically important challenges at northwest Ethiopia. Also [17], reported that disease, feed shortage, predators and poor housing condition are constraints of chicken production

in Lemo District, Hadiya Zone and similar finding was pointed out by [2] in Marako Woreda, Gurage Zone, Southern Ethiopia.

**Table 4.** Constraints of chicken production at the study area.

№	Constraints	Respondents percentages	percentage	Rank
1	Feed shortages	15	50%	1 <sup>st</sup>
2	Disease	2	6.4%	2 <sup>nd</sup>
3	Predators	11	36.6%	2 <sup>nd</sup>
4	Lack of improved breed	3	10%	4 <sup>th</sup>

## 5. Conclusion

Lohmann Brown chicken breed show better performance for environmental survivals at their growing period compared to the local breed. The result from farmers response also shows the breeds are promising in most of the attributes such as egg production, disease resistance, able to rear year round, medium and rapid sexual maturity So, it could be concluded that Lohmann Brown chicken breed are good survivals at midland climatic condition. The breed got high acceptance among farmers due to above mentioned reason. Therefore, appropriate veterinary and advisory services, training on improved poultry house and formation of poultry feed shortage, disease and predators are main economically important challenges in the study area. Therefore, appropriate

veterinary and advisory services, training on improved poultry house and formation of poultry feed suppliers are necessary to overcome the challenges.

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