Advanced Research Journal of Plant and Animal Sciences: ISSN-2360-7947: Vol. 3(12): pp 061-068, December, 2017.

Research Paper

Poultry Production and Management system of Rhode Island Red Chicken in Damboya Woreda, Kambata Tambaro Zone, Southern Ethiopia

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Accepted 20th December, 2017.

The study was carried out in Damboya Woreda, Kembata Tembaro Zone, Southern Ethiopia. The objective of the study was to assess the production and constraints of Rhode Island Red (RIR) chicken poultry breeds. The study was carried out by preparing semi structured questionnaire to collect data on poultry production systems, feeding system, flock size, housing and major constraints. Data were collected randomly from 90 households. Secondary data were also collected from the government and non-government office center. The collected data was analyzed by using descriptive statistics such as frequency and percentage. The majority of respondents (72.2%) were Protestant whereas 17.8% and 10% were Muslim and Orthodox religion followers respectively. Out of the interviewed respondents 42% were males and the rest (58%) were females. The dominant RIR chicken production system was extensive (54.5%) followed by semi-intensive (35.5%) and intensive (10%) in the study area. All the respondents provide house for poultry either in separated or non-separated houses. Layers were the dominant flocks (43.6%) as compared to pullets and cockerel. The major source of feed for RIR chicken was cereal crops and 52.3% of the respondents provide supplementary feeds twice a day. All of the respondents provide supplementary feed from which 52.3% of respondents supply feed in addition to scavenging twice a day either early in the morning and late in the evening. However, 25.5% fed once a day in addition to scavenging system whereas 22.2% feed three times a day. The main constraints affecting the Rhode Island Red chicken breed productivity in the study area were feed shortage, predators and disease. Therefore, improving production and management system such as feeding, housing, overall management system of RIR chicken on the farmers' level, providing sustainable training is the most crucial point to improve the livelihood of the farmers as well as national income of the country.

Keywords: Rhode Island Red, Flock size, Households, Feeding, Poultry, Productivity, Management, Semi-intensive.

INTRODUCTION

Poultry production has great role in the economies of a country. It has also cultural social benefits that have higher contribution in the nutrition of family in developing countries, like Ethiopia. Poultry meat and egg production

accounted for more than 28% of the total animal protein produced worldwide in 1997 [1]. Poultry are kept for mainly meat, egg and dual production. Currently the egg laying and meat producing improved commercial poultry breeds are being generating in many farmers. Advances in qualitative genetics and increasing more rapid application of new breeding methods and selection has led to the involvement of biological types which deferent in considerable in their physiologically and morphologically from their wild prototypes. All this calls for concurrent improvement in environmental factors Such as improved nutrition effective control of disease and parasite, improved housing conditions and good husbandry [2]. Poultry reproduce themselves very fast. There are some religious or social customs which discourage meat and egg consumption. Poultry products services as a source of cheaper protein with high quality human feed.

Even if there is no recorded evidence indicating the exact time and locations of introduction of the first batch of exotic breeds of chickens into Ethiopia for genetic improvement, it is widely believed that the importation of the first batch of exotic breeds of chicken was done by missionaries [3]. Yet with large poultry population, Ethiopian poultry industry remain highly undeveloped, unorganized and the country export almost no poultry meat [4]. Attempts have been made to introduce different exotic poultry breeds to small holder farming systems of Ethiopia because of low performance of indigenous chicken [5]. With the aim of improving poultry productivity, different breeds of exotic chickens (Rhode Island Red, Australorp, New Hampshire and White Leghorns) were imported to Ethiopia since the 1950's. Since then higher learning institutions, research organizations, the Ministry of Agriculture and Non-Governmental Organizations (NGO's) have disseminated many exotic breeds of chicken to rural farmers and urban-based small-scale poultry producers [6].

Even though Rhode Island Red has a great economic importance and distributed widely the production and the management of this breed is not well studied and documented at *Damboya Woreda, Kambata Tembaro*, Zone Southern Ethiopia in particular and Ethiopia in general. This research was conducted to assess Rhode Island Red poultry production and management as well as the problem that hinders the performance and productivity of the breed in the study area. Therefore, the study tried to determine and asses the existing Rhode Island Red production, management and major constraints in the study area.

Objectives

- ✓ To assess the production system and management of Rhode Island Red breed in the study area.
- ✓ To identify the constraints of Rhode Island Red breed in the study area.

METHODOLOGY

Description of the study area

The study was conducted in Damboya Woreda, Kembata Tembaro Zone, Southern Ethiopia. It is located 324 kilometer from the capital city of Ethiopia (Addis Ababa) and 106 km from Hawassa which is the capital city of SNNPR. It is located at 07° N latitude and 37° E longitude of the Woreda. The Woreda is divided in to 20 kebeles. It is found at the altitude between 1750-3008 m.a.s.l. The annual rainfall ranges between 700-1200 mm and temperature 26°C-22 °C [7]. According to the information gathered from Damboya Woreda Agricultural office the total area of land is 18, 318 hectare. From this 17849.2 hectar of land is cultivable whereas 468.8 uncultivable. The Woreda has two climatic Zones namely 30% is highland ("*Dega*") and 70% mid altitude ("*Woyinadega*"). The total livestock population of cattle, sheep, goat, poultry, pack animals is 93846, 15244, 5469, 1554246 and 6194 respectively [8].

Sampling

The Woreda has 20 Kebeles from which 4 kebeles are "Woyinedega" and 16 Kebeles are "Dega". To make the data representative one kebele from Woinadega and 4 Kebeles from Dega were selected purposely on the basis of their potential for RIR poultry production (*Geremba, Hameancho, Ambaricho, Kota and Megere*). Then 18 respondents were selected from each kebele purposely. Thus, totally the number of households included in the present study was ninety (5 Kebeles*18 households).

Types and source of data

The type and source of data for this study was both primary and secondary data. The primary data was collected by preparing semi-structured questionnaires whereas the secondary data was taken from past research documentary sources, internets and other published and unpublished sources.

Methods of data analysis

The collected data was analyzed by using simple descriptive statistics. Finally, the result was organized by in the form of table and percentage. .

RESULT AND DISCUSSION

Socio Economic Status

Sex, family size and Age group of the respondents

The socio-economic status of the interviewed households is presented in Table 1. Out of the interviewed respondents 42% were males and the rest (58%) were females. It was observed that poultry management was mainly the business of women (58%). Similar findings were noted by [9] who indicated that in most cases the women owned and managed the birds and controlled the cash from the sale in the central highlands of Ethiopia. This could be mainly due to the fact that poultry keeping is a backyard activity in the village system to which women are closer. The majority (45%) of the respondents had family size of lower than five (table 1). In the same manner, the majority (73%) of the respondents' age was in the range of 25-55 years which is active to undertake poultry production effectively.

Table 1: Sex, Family size and Age group of households (years) of the respondents

Variables		Number (N=90)	Percentage (%)
Sex of households	Male	38	42
	Female	52	58
Family size of the respondents	<5	40	45
	6-10	30	33
	>10	20	22
Age group of households (years)			
	25-55	65	73
	> 55	25	27

Religion of the respondents

According to the table 2, the majority of respondents (72.2%) were Protestant whereas 17.8% and 10% were Muslim and Orthodox religion followers respectively. This finding disagree the findings of [10] who concluded that majority (96.7%) of the respondent farmers belonged to the orthodox religion in East Gojam Zone, Amhara Regional State, Ethiopia. This difference may be the environmental differences in which the study conducted that may be a reason for the variation of culture and religion.

Table 2: Religion of the respondents and marital status of respondent

Type of religion	*Geremba*	*Hame-ancho*	*Ambaricho*	*Kota*	*Megere*	Total	Percentage
Protestant	13	14	18	15	5	65	72.2
Orthodox	2	1	3	1	2	9	10
Muslim	1	0	2	0	13	16	17.8
Others	-	-	-	-	-	-	-
Total	16	15	23	16	20	90	100

Educational back ground of respondents

As it is indicated in table 3, the higher proportions (42.2%) of the respondents were able to read and write whereas 26.6% were illiterate. This finding is nearly similar to [11] who argued that 33% were able to read and write in the study of characterization of urban poultry production System in Northern Gondar, Amhara Regional State, Ethiopia.

Table 3: Educational back ground

Educational status	Total	percentage
Illiterate	24	26.6
Read and Write	38	42.2
Elementary school	15	16.6
High school	13	14.6
Total	90	100

The Marital status of respondents

As it is indicated in the table 4, in the study area the majority of respondents participated in poultry production were married. From the total numbers of respondents (44.5%) were married, 32.2% were single, 15.5% were widows and 7.8% were divorce in the study area.

Table 4: Marital status of respondents

Marital type	*Geremba*	*Hame-ancho*	*Ambaricho*	*Kota*	*Megere*	Total	percentage
Married	11	6	8	7	8	40	44.5
Single	6	7	4	4	8	29	32.2
Widows	3	2	2	3	4	14	15.5
Divorce	1	1	2	2	1	7	7.8
Total	21	16	16	16	21	90	100

Poultry Production system

The results of the study (Table 5) indicated that poultry production in the study area is practiced more by the scavenging management system (54.5%). This finding is slightly lower than the study conducted by [10] who showed that the dominant (83.3%) chicken production system in the study area is a free range or extensive type. chickens were managed mainly on free ranging, utilizing various feed sources searching by their own in the field, with conditional feed supplementation.

Table 5: Production system of Rhode Island Red Chicken

No	Types of management	Frequency	percentage
1	**Extensive**	49	54.5%
2	**Semi-intensive**	32	35.5%
3	**Intensive**	9	10%
	Total	90	100%

Housing of RIR chickens

As indicated in table 6, all the respondents provide house for poultry either in separated or non-separated houses. The majority (65.6%) of the respondents use non-separated housing system, which is together with human and livestock. The poultry spent the night time in the corner or above the ground on somewhere at night in the house. The rest of the respondents (34.4%) use separated housing system, which is separated from livestock and humans. They take at the night and in their own house. Similar findings also reported by [10] who indicated that almost all farmers provided night shelter for their chickens like in separate sheds purpose-made for chickens.

Table 6: Housing system of Rhode Island Red Chicken

Types of housing	Frequency	Percentage
Separated	31	34.4%
Non-separated	59	65.6%
Total	90	100%

Flock size of Rhode Island Red chicken

As indicted in table 7, the dominant flock structure in the study area were laying hens (43.6%), followed by pullets (35.1%), chicks (13.3%) and cockerels (8%). Similar findings were also reported by [12] who indicated that the dominant flock structure in the study area were laying hens (42.4%), followed by pullets (19.1%), chicks (15.5%), cocks (12.2%) and cockerels (10.7%). The relatively higher proportion of laying hens per household in the study area might be because of the interest of the farmers for increased egg production and using laying hens as parent stocks for hatching as the sources of replacement. The relatively higher proportion of laying hens per household in the study area might be because of the interest of the farmers for increased egg production and using laying hens as parent stocks for hatching as the sources of replacement.

Table 7 : Flock size the poultry

Flock size	Number of chicken	Percentage
Layer	300	43.6
Pullet	240	35.1
Chick	92	13.3
Cockerels	55	8
Total	687	100%

Major source of feed for Rhode Island Red chicken

According to the data collected, the majority (51.2%) of the respondents use feeds cereal crops, such as wheat, corn, sorghum as the major feed resource for their chicken (table 8). Next to cereal crops 26.6% of poultry feed source is house hold wastes. The remaining 22.2% of the respondents provide industrial by-products for their chicks. This shows that industrial by-products are far from the area and its products are too expensive. This result is in agreement with [13] who concluded that corn is the most known cereal grain used by poultry production, supplying about 1/3 of the total feed which they consume wheat, barley, oats and sorghum grains are also used expensively in poultry ration.

Table 8: Source of feeds for poultry

Source of feeds	Number of respondents	Percentage
House hold waste	24	26.6%
Industrial by product	20	22.2%
Cereal crops	46	51.2%
Total	90	100%

Feeding system of Rhode Island Red Chicken

As it is indicated in table 7, all of the respondents provide supplementary feed from which 52.3% of respondents supply feed in addition to scavenging twice a day either early in the morning and late in the evening. However, 25.5% fed once a day in addition to scavenging system whereas 22.2% feed three times a day. This findings is slightly similar with results of [10] who showed that all (100%) of the respondent farmers practiced in providing supplementary feed to chicken, which is usually offered 56.7% once per day, 34.4% twice per day and the remaining 8.9 % provide supplementary feed more than twice per day (Table 9).

Table 9: Feeding system of Rhode Island Red Chicken

Feeding allowance par-day	Frequency	Percentage
Once	23	25.5%
Twice	47	52.3%
Three times	20	22.2%
Total	90	100%

Main constraints of RIR chickens in the study area

According to the survey results, (41.1%) of respondents indicated that shortage of feed availability is the major constraints for RIR chicken production in the study area (table 10). This result was similar to the idea of [14], scavenging chicken may be capable to find feed for their maintenance and higher production require supplementary feed, due to their need satisfaction chickens move for scavenging in rural area, which expose them for predators. Disease and predators are also the major constraints in rearing RIR poultry production for 36.7% and 22.2% of the respondents respectively next to feed shortage respectively. This is also in agreement with [15] who concluded that disease and predators are also the problems in poultry production.

Table 10: Main constraints affecting Road Island Red chicken production and productivity

No	Types of constraints	Total	Percentage
1	**Disease**	33	36.7%
2	**Shortage of feed**	37	41.1%
3	**Predators**	20	22.2%
	Total	90	100%

CONCLUSION

Rhode Island Red Chicken production and management system in *Damboya* Woreda *Kambata Tambaro* Zone, Southern Ethiopia are mainly reared based on cereal crops and household wastes. The main feed supply to chicken was, like wheat, corn, sorghum, barley and other household wastes. The production system is mainly extensive which is of low management system, and results failure in production of poultry. All of the respondents provide house for their chickens either in separated (34.4%) or non separated (65.6%) system. The research revealed that, household has information about the use of RIR chicken on the economical, socio-cultural, and nutritional aspects of life. But the majority of household's rear under extensive management system (54.5%) of poor feeding and management system was practiced. A high number of household women (58%) actively participate in poultry production using RIR breed by their local knowledge of poultry management to generate income and to complete the protein requirement of household. According to the survey results, the majority of respondents (41.1%) indicated that shortage of feed availability is the major constraints for RIR chicken production in the study area

RECOMMENDATION

Based on the assessment of Rhode Island Red chicken production and management system the following points should be recommended.

- Better to improve the scavenging system of poultry production system
- Provide training for farmer how to manage and construct house for chicken separately from human and livestock.
- Improve feeding system in household's level and also better it feed processing plant to reduce feed shortage in the study area.
- Improving management techniques to promote productivity

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