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Product Utilization, Constraints and Opportunities of Village Chicken under Traditional Management System in Gantaafeshum District of Eastern Tigray, Ethiopia

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Abstract
A survey was conducted on product utilization, constraints and opportunities of village chicken in Gantaafeshum district of Eastern Tigray, Ethiopia. Data were collected from a total 160 chicken owners by using semi-structured questionnaire. Utilization of eggs as a nutritional food (40%) and medicine (68.1%) was practiced out of the total respondents. Mostly eggs and birds were used for sale and replacement, respectively. About 56.4, 31.9 and 11.7% of eggs produced were used for sale, hatching, and consumption, respectively. The farmers' sale their chicken mostly when there is an instant cash need in the house (64.4%), when disease outbreak occurs (12.5%) and during the major crop planting season (23.1%). Predation and disease were the main constraints of chicken production followed by shortage of capital, lack of extension service and market distance. It was concluded that efforts have to be made on predator and disease control, improved management, access to credit services and creating market linkage.
Keywords: Product utilization, Indigenous chickens, scavenging, traditional management

Introduction

Population growth, urbanization and rising income in many parts of the developing world is believed to result in a growing demand for food from animal origin. The importance of village chicken production in national economies of developing countries and its role in improving the nutritional status and incomes of many small farmers and landless communities has been recognized by various scholars and rural development agencies for the last few decades (Tadelle *et al*., 2002; Fisseha *et al*., 2010 and Aberra *et al*., 2011). Ethiopia is one of the few African countries with significantly large population of chicken which is estimated to be 44.9 million chickens, out of which 96.61 percent are local chickens (CSA, 2012).

Rural chicken production in Ethiopia represents a significant part of the national economy in general and the rural economy in particular, and contributes 98.5 and 99.2% of the national egg and chicken meat production, respectively (Tadelle *et al*., 2002), with an annual output of 72,300 metric tons of meat and 78,000 metric tons of eggs (Hailemariam *et al*., 2006). According to McAinsh *et al*. (2004) village chickens play many socio-economic roles in traditional religious and other customs, as gift payments and serve as an important source of animal protein food to the families of smallholder farmer. They are also considered to be the main source of income for the rural poor (Muchadeyi *et al*., 2005; 2007). However, the production level of scavenging hens is generally low, with only 40-60 small sized eggs produced per bird per year under smallholder management conditions (Fisseha *et al*., 2010; Negussie *et al*., 2010; Aberra and Tegene, 2011).

In the study area there was no researches done in relation to village chicken product utilization, constraints and opportunities. It is therefore essential to conduct research that could generate appropriate technology, which is socially acceptable, environmentally sound and economically feasible. The present study was undertaken to identify the major constraints and opportunities of village chicken production under traditional management system.

Materials and Methods

Description of the study area

The study was conducted in Ganta afeshum district which is located 928 km north of Addis Ababa and situated between latitudes 10°10'N to14°20' N and longitudes 38°28' to 39°15' E. The altitude of the district ranges from 1200-3000 m a.s.l, of which Dega above 2600, Woina-dega 1550-2600 and Kola below 1550. The annual temperature is 15 ^{0}C-24 ^{0}C, while the annual rainfall ranges between 350-700 mm. The livestock resources of the district are 51,519 cattle, 57,163 sheep, 32,882 goats, 67,269 poultry, 6,944 donkey, 59 horse, 5 mule and 7791 beehives (3201 modern and 4590 traditional) (BOANR, 2010).

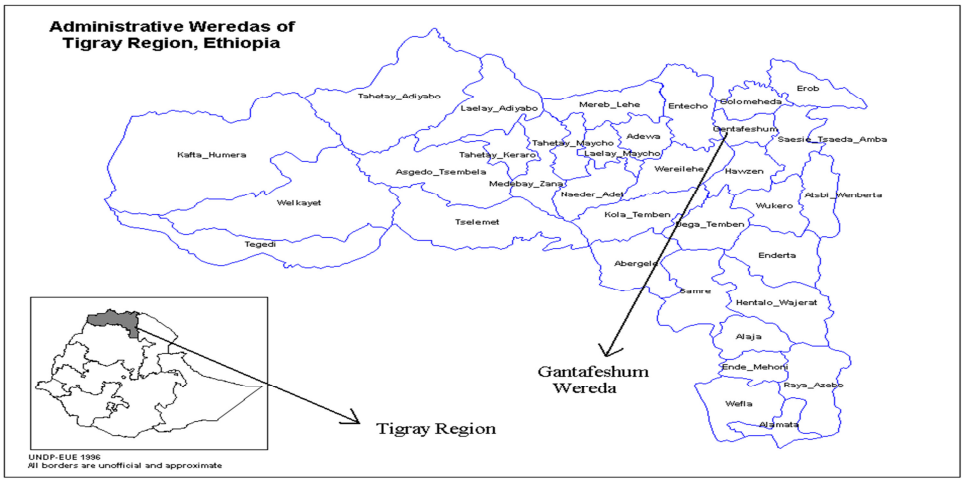

Figure.1. Administrative Weredas of Tigray Region indicating Gantaafeshum wereda.

Sampling technique

The study was conducted in eight peasant associations (PA's) of the district 2 PA's from Dega (Hagereselam and Migulat), 4 PA's from Weinadega (Sasun, Buket Mymesanu and Mergahiya) and 2 PA's from Kola agro-ecology zones (Smret and Wuhdet) proportional to the size of agro-ecology selected by stratified random sampling technique. Twenty households which own chickens were selected randomly from each identified PA are making a total of 160 households.

Data collection and analysis

Information was collected from individual farmer, extension officer and key informants through using a semi-structured questionnaire. Secondary data was collected from district's rural agricultural development office. The generated information was analysed using descriptive statistics of SPSS (SPSS ©, Version 20).

Results and Discussion

Utilization of Chicken and Chicken Products

As presented in Table 1, Eggs were given as a nutritional food for children and sick people by 16.9%, only for children by 6.2% and for all age group by 16.9%, while about 60% of the respondents didn't use egg as nutritional food. About 68.1% of the total households use eggs as a medicine to treat common cold, pneumonia and tuberculosis (TB) for all age groups and children.

Table 1. Age of consumers and purpose of egg consumption

Use of chicken egg and age group	Number of respondents	Percent respondents
As nutritional food for (160)		
Children & patients	27	16.9
All age group	27	16.9
Children only	10	6.2
Not used	96	60
As a medicine for (160)		
All age group	96	60
Children only	13	8.1
Not used	51	31.9

Numbers in parenthesis indicate total number of respondents

The demand for egg in the study area coupled with low household income from crop production (mainly due to climatic problems and small land holding) might have made the farmers to sell the largest proportion (56.4%) of eggs produced. The study indicates that about 12% of the eggs were used for consumption which is very low compared with that of reported by Tadelle (1996), Tadelle *et al*. (2003b) and Mammo (2006). Thus comparing with the results documented in Ethiopia, it can be speculated that the main objective of poultry production in the study area is to sell the eggs rather than to use eggs for home consumption. Thus their role in providing high quality protein to family food balance is comparatively low.

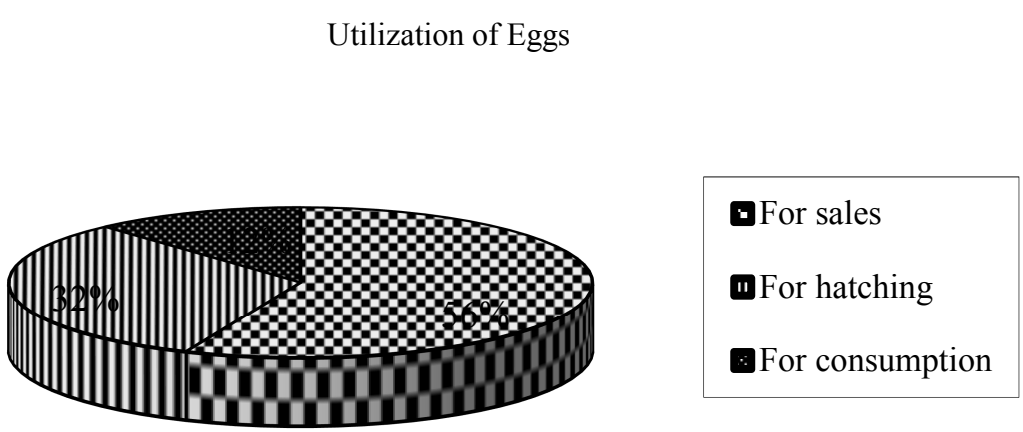

Figure 2. Utilization of eggs produced within last one month (% eggs)

Live chicken were used for replacement, sale and consumption in their order of importance. According to the perception of respondents, out of the total chicken found six months before the study time, the average number of chickens used for replacement, sold, consumed and gift was 3.77, 2.76, 0.92, and 0.12, respectively and was not in line with the results of Tadelle (1996) and Tadelle *et al*. (2003b).

Table 2. Utilization of chicken within last six months (Mean±SE)

	Agro-ecology			
Utilization of chicken for	**Dega (40)**	**Weinadega (80)**	**Kola (40)**	**Overall mean (160)**
Replacement	3.22± 0.18 (48%)	3.99 ± 0.18 (50.2%)	3.88± 0.33 (50.5%)	3.77± 0.12 (49.8%)
Sale	2.5± 0.17 (36.8%)	2.82 ± 0.14 (35.6%)	2.9± 0.19 (37.8%)	2.76± 0.09 (36.4%)
Consumption	0.8± 0.11 (11.9%)	1.02± 0.08 (12.9%)	0.85± 0.09 (11.1%)	0.92± 0.05 (12.2%)
Gift	0.22± 0.07 (3.3%)	0.1± 0.04 (1.3%)	0.05± 0.04 (0.65%)	0.12± 0.03 (1.6%)

As indicated in Table 3, the majority of households did not use chicken meat as medicine (68.8 %) and as nutritional food (73.1 %). Thus the primary objective of poultry production in the study areas was to increase the household income by selling live birds to the market. However, use of chicken meat as medicine and improving the nutritional status of the family members cannot be under evaluated. This was in agreement with the finding of Tesfu (2006).

Table 3. Age group of consumers and purpose of consumption of chicken meat

Use of chicken meat and age group	**Number of respondents**	**Percent respondents**
As medicine for		
All age group	50	31.2
Not used	110	68.8
As nutritional food for		
All age group	32	20
Patients	11	6.9
Not used	117	73.1

Marketing

There is no systematic marketing operation of chicken and chicken products in the study area. Selling of live birds and eggs were a common practice in the study area. In Kola agro-ecology, Bizzet was the main and in most cases the only nearby market, while for those households found in Weinadega, Adigrat was the main market site. For households residing in Dega agro-ecology, there is nearby small village market (primary market) called Migullat in addition to the above two main markets. In the study area, chickens and eggs were immediate

sources of income to cover the daily minor household expenditures.

Majority of the respondents (91.2%) sell chicken and chicken products in the main markets at Bizzet and Adigrat. The rest 8.8% of the interviewed households sell chicken and chicken products in the nearby small village markets. Farmers sell their chicken mostly when there is an instant cash need in the family (64.4%), when there is disease outbreak to occur (12.5%) and during the major crop planting season (23.1%). Most of the farmers (70%) did not consider season when selling chickens. The remaining (28.8%) and (1.2%) of the respondents sale their chicken during rainy and dry season, respectively.

About 93% of the interviewed households revealed that there were problems relating to poultry marketing in the area. The major problems were price fluctuation (49.4%), long distance of the market (25%) and poor marketing structure (18.8%). This was in agreement with Gausi *et al*. (2004) the major constraints in rural chicken marketing were identified as poor price, low marketable output and long distance to reliable markets. As a result, the smallholder farmers are not in a position to get the expected return from the sale of chickens.

Table 4. Marketing characteristics of the study area

Characteristics	Number of respondents	Percent Respondents
Reasons for selling (160)		
When money is need	103	64.4
When disease outbreak	20	12.5
During crop planting	37	23.1
Season of selling (160)		
Rainy season	46	28.8
Dry season	2	1.2
Any season	112	70
Place of selling (160)		
Main market	146	91.2
Nearby market	14	8.8
Marketing problems (149)		
Good price only on holidays	79	49.4
Long distance of the market	40	25
Poor marketing structure	30	18.8

Numbers in parenthesis indicate total number of respondents

Constraints of Chicken Production in the Study Area

Based on the respondents' perception, about 39.4% of respondents ranked predation as the most important constraint followed by disease (21.2%), capital (17.5%), lack of extension service (13.1%) and market distance (8.8%). In the study areas, leaving the plain land for cultivation, most households had settled along the foot of mountains and chickens were scavenging in the surrounding of bushes and shrubs where predators can hide. Moreover, farmers who have their houses on the plain areas lack trees in their surrounding that protect easy picking of chickens by predators. This is in agreement with the finding of Tesfu (2006) who reported that, predation followed by disease and lack of sufficient capital were the major constraints of chicken production. In the area about 84.4% of the households did not get extension service for their chicken. Thus in the area lack of extension service was also a limiting factor for poultry production next to disease and capital.

Table 5. Major constraints of chicken production in the study area

Constraints	Number respondents	Percent Respondents
Predation	63	39.4
Disease	34	21.2
Capital	28	17.5
Lack of extension service	21	13.1
Market distance	14	8.8

Opportunities of Chicken Production in the Study Area

Feed and water availability

In the study district, there are many cereal grains and pulses that are used for supplementing to chicken production. Moreover, the district is well known for its streams, springs, small and large perennial rivers and different types of water harvesting physical structures i.e. ponds and so on. This has created high opportunity for endorsing the existing traditional chicken production in the areas.

Employment opportunity
With relatively low startup costs and minimum land requirements, poultry offers high potential for outreach programme for safety net beneficiaries. Cooperative-based production schemes offer opportunity for the landless and youth. This sub-sector also favorable for all age groups like men, women, youths and childrens.

Traditional know-how
In the study area, chicken production practice has a long history, as a fact, the farmers have developed indigenous knowledge which was passing from generation to generation. The main areas of indigenous poultry knowledge are house construction from locally available materials, treating through traditionally medicinal plants, and selection of breeds. Presence of long standing chicken production practices and indigenous know how is very important to improve the existing practices than introducing new practices.

The attention of the government to improve poultry
The government has increased its attention to develop the poultry sub-sector as one of its strategies for poverty reduction and diversification of export commodities. Recent initiatives taken by the public and private sectors as well as non-governmental organizations (NGOs) are in the right direction towards improving the possibility of exploiting the potential of the poultry sub-sector.

Conclusion
Chickens support food security at household level through not only direct consumption, but also creating an enabling economic environment that enables farmers to have better purchasing power or better access to purchase food. Eggs were used for sale, hatching and consumption, while live chicken were used for replacement, sale and consumption in their order of importance. This indicated that the extensive backyard poultry production in the study area is used to generate cash income mainly through egg production. About 39.4 percent of respondents ranked predation as the most important constraint followed by disease, capital, and lack of extension service and market distance. Despite the many problems involved in keeping poultry, relatively promising performance of the local chicken in the study area were observed in terms of high hatchability, relatively good egg production per year and per clutches which fulfils the product utilization of the households in the district. Thus, the following recommendations are suggested based on the survey result.

- Predation is a significant cause for the loss of chicken in the study area. Simple house construction especially designed for chickens using locally available materials can easily protect birds from being attacked by predators.
- Administration of regular disease prevention mechanism and appropriate vaccination program will undoubtedly reduce mortality.
- Training for both farmer and extension staffs focusing on disease control, improved housing and feeding should be taken in to consideration.

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