

Opportunities and challenges of indigenous chicken in Asella district, Arsi zone, Oromia, Ethiopia: implications for designing improved productivity schemes

Abstract

This study was carried out to assess production constraint and marketing system of indigenous chickens from November 2016 to May 2017 in Asella district, East Arsi zone of Oromia, Ethiopia. A total of 120 respondents were included in (the study from four purposively selected kebeles kebele 12, kebele 13, konicha and tullukuche). The critical production constraints were disease (39.2%), predators (25.8%), poor management (21.7%) and lack of feed (11.7%). Newcastle Disease (locally called “fengil”) was the major health constraint. This study revealed that there was a high amount of robbery in the town with 33% and also wildcat 29.2%. Majority of the respondent use separate house construction 45.8% and different shelter for night enclosure 27.5% as well as share the same room with family 26.7%. Even if there were veterinary clinic in the area 59.2% the respondent bought a drug from private drug store 71.7% and also use a traditional medicine 45% that are given or administered in their own 67.5%, though most of treatment are not effective 63.3%. majority of respondent in the study area bought their chicken at September-December (51.7%) from market (59.2%) with a common transporting material in the area, zenbil (50%) and sold during religious celebration (66.7%) directly to consumer (66.7%) with great preference for plumage color (white 40.8% and red 35.8%). Therefore, efforts have to be made to improve the productivity of indigenous chickens in sustainable way as well as provide extension service to create awareness for vaccination and treatment of their chicken.

Keywords: asella, diseases, indigenous chicken, marketing system

Volume 6 Issue 3 - 2018

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Received: May 23, 2018 | **Published:** June 15, 2018

Introduction

In many countries of the world, poultry are kept as scavengers in and around the residence areas at village and family level.¹ With an estimated total population of 1.6 billion at the end of 2010. Village chicken is the most abundant species in Africa, contributing a significant part of the continents economy.² Production of Chicken plays important socioeconomic roles in developing countries.³ Provision of animal protein, generation of extra cash incomes and religious/cultural considerations are amongst the major reasons for keeping village chickens by rural communities.⁴

In Ethiopia chickens are the most widespread where almost every rural family owns chickens, which contribute greatly to supply of eggs and meat.⁵⁻⁷ The total chicken population in the country is estimated to be 56.9 million.⁸

In Oromia region contributes 35.30 % of the total chicken population in the country. Even with in the Oromia region majority of the chicken are found in the Arsi zone followed by Jimma and West Shoa zone.⁹ Provision of animal protein, generation of extra cash income and religious/cultural considerations are amongst the major reasons for keeping village chickens by rural communities.⁴

In Ethiopia, generally, the chicken rearing system is characterized by extensive scavenging management, no immunization programs, increased risk of exposure of chicken to disease and predators where there is no or minimum intervention to maximize their production.¹⁰ and also it is characterized by low input with little supplemental feeding, no separate shelters except night shelter, low veterinary services, minimal level of bio-security and high levels of mortality.¹¹⁻¹³

Indigenous chickens are good scavengers as well as foragers and have high levels of disease tolerance and are adapted to harsh conditions and poor quality feeds as compared to the exotic breeds. In Ethiopia, however, lack of knowledge about poultry production, limitation of feed resources, and prevalence of diseases as well as institutional and socioeconomic constraints¹⁴ remains to be the major challenges in village based chicken productions.

Village chicken production fits quite well with the conditions of rural households due small feed cost, space requirement and low price of the animals.¹⁵ The major feed provided for village chickens is grains produced on-farm, and feed availability is high during the dry season and harvesting period from December to March, and from November to January.¹⁶

Village chickens are sold in local and urban markets to traders (collectors) or directly to consumers depending on the location of the farm dwelling. According to¹⁷ and Halima,¹⁸ smallholder village chicken owners found in different parts of the country sell chicken to purchase food items, to cover school fees, to get cash for grain milling services, to purchase improved seeds and to adjust flock size¹⁹ also reported that few farmers in central highlands of Ethiopia exchanged their free range chicken for food and household items.

Plumage colour, live weight and comb type were some factors affecting chicken price at market.²⁰ however unstable price and seasonal demand of live chicken were some of subjective forces of farmers to sell their chicken and chicken product to small retailer in low price.²¹

Most consumers in Ethiopia prefer to buy local chicken from village producers, since they are considered to be tasty and better suited for preparation of the traditional chicken sauce. As a result, free ranging local chicken are in higher demand and fetch higher market prices in urban markets.²²

Asella town (Tiyo woreda) is the capital city of East Arsi zone. In which majority of chicken production is practiced under extensive management system which provides people benefits in source of income as well as for home consumption (meat and egg). However, due to inadequate health care, presence of predator and thief and lack of proper management as well as seasonal demand and supply at market reduces the output obtained from local chicken in the area.

Therefore, considering with this point of view this study was conducted with the objective of assessing:

- I. Production constraint and
- II. Marketing system
- III. To call a base line information on the current status of a disease and predator.

Methods and material

Study area

The study was conducted from November 2016–April 2017 on production constraint and marketing system of indigenous chicken in and around Asella, located in the Arsi zone of the Oromia region about 175kilometer from Addis Ababa, this city has a latitude and longitude of 7°57'N 39°7'E, with an elevation of 2,430 meters.

Study animal

The study animals were indigenous chicken in and around Asella town of Oromia Regional State, maintained under traditional small holder extensive management production system. A study area was considered with irrespective of age, sex and body condition.

Methods of data collection

The data was collected by using semi-structured questionnaire and interview from 120 randomly selected respondents in four kebeles in the area (kebele12, kebele13, konicha and tullukuche). 30 house hold respondents from each kebele were randomly selected. In addition to this there were interviewing with seller, buyer and middle men in selected market areas. Major constraints, feed provided, housing system, management of chicken, veterinary service and health care as well as marketing system of indigenous chicken were collected.

Data analysis

Data were entered and managed in Microsoft excel. Statistical Package for Social Sciences Inc 20. SPSS version 20 soft were used for the data analysis. Descriptive statistics such as mean and percentage was used to summarize and present the results.

Results and discussion

Purpose of indigenous chicken production

Majority of respondent (47%) use their chicken for income generation by selling the egg and the live chicken followed by home consumption (28%), others, like saving (22%) and slaughter during festival (3%) (Figure 1). This is similar with the report of²¹ who indicated that small holder village chicken owner sell their chicken and eggs to get income or cash. Most of producers rear their indigenous chickens to generate incomes by selling eggs and marketable chickens.^{23–25} Smallholder village chicken owners found in different parts of the country sell chicken and eggs to purchase food items, to cover school fees, to get cash for grain milling services, to purchase improved seeds and to adjust flock size.¹⁸

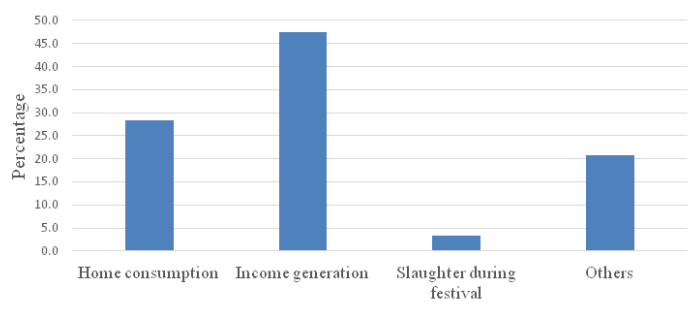


Figure 1 Purpose for indigenous chicken production in Asella district, Arsi Zone of Oromia, Ethiopia.

Feed supplementation

The majority of respondents (47%) were depend on supplementing grains since there is a high amount of seed production in the area like maize and wheat. followed by scavenging (23%) the respondent allowing there hen to search their food in their own with seasonal feed supplementation. (18%) of the respondent provide family left over feed and only (12%) of respondent provide kitchen waste for their chicken (Figure 2). This implied that producers have awareness about feed supplementation. However the chicken production system is still traditional. The grain feed supplementation were different with seasonal conditions. This in line with the report of²⁶ reasonable grain feed supplementations varied with cultivates. Feed supplements such as grains, food leftovers and kitchen waste were offered once a day early in the morning. A previous study conducted by¹³ in Ethiopia showed that 83% of the 225 chicken farmers were practicing scavenging and supplementary feeding management system. Similarly,²³ reported that human feed leftover as source of feed for village chicken in Ethiopia. In indigenous chicken production systems, it is difficult to estimate the economic and/or physical value of feed resource input because there are no direct methods of estimating the scavenged feed input.

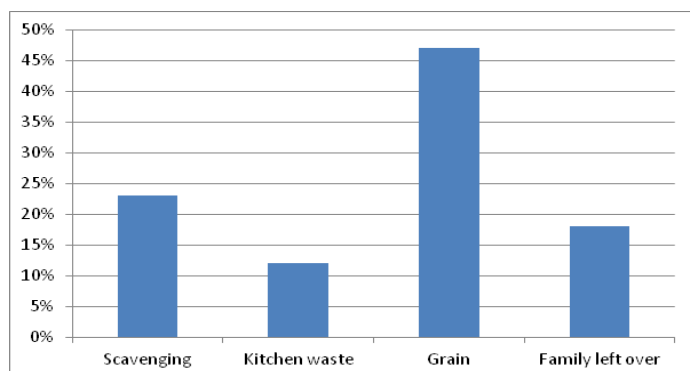


Figure 2 Feed provided for indigenous chicken in Asella district, Arsi Zone of Oromia, Ethiopia

Constraints of indigenous chicken production

In Ethiopia, lack of knowledge about poultry production, limitation of feed resources, prevalence of diseases (Newcastle, Coccidiosis, etc) as well as institutional and socio-economic constraints¹⁴ remains

to be the major challenges in village based chicken productions.

The major constraints of indigenous chicken production in the study area is presented in Table 1 during this study, the respondent were listed the major limiting factors of poultry production. The primary problem cited was disease, predation, poor management and feed shortage. This result revealed that disease (39.2%) and predator and thief (25.8%) identified as a major constraints. respondents had suffered serious losses due to disease and predator. This may due to extensive /scavenging/ feeding system of chickens and suitability of the area for presence of predators. This study agrees with report of;^{27,28} Disease and predators are known to be the major causes of mortality in the country. Newcastle Disease (NCD) (Locally called “Fengil”) was identified as a major and economically important health constraint that hinders the expansion of indigenous chicken production in the study area. It is in line with the report of²⁹ who indicated that NCD is one of the major infectious diseases affecting productivity and survival of village chicken in the central highlands of Ethiopia. It was also reported by³⁰ that NCD was the single major health constraint, which cause heavy mortality and morbidity to village chicken and affects productivity of the system in the country.

Table 1 Indigenous chicken production constraints in Asella district, Arsi Zone of Oromia, Ethiopia

Variable	Peasant associations (frequency)				Overall frequency	Percentage
	Kebele 12	Kebele 13	Konicha	Tullukuche		
Major constraints						
Disease	10	12	12	15	47	39.2
Feed shortage	5	3	4	2	14	11.7
Poor management	9	10	4	3	26	21.7
Predator and thief	6	5	10	10	31	25.8
Type of predator						
Chilfit/chulule	2	3	10	13	28	23.3
Shelemetmat	0	2	7	8	17	14.2
Wild cat	8	9	10	8	35	29.2
Thief	20	16	3	1	40	33.3
Predator control measures						
Building house	17	14	11	14	56	46.7
Fence the Furrounding	6	7	2	5	20	16.7
Killing measure	4	2	9	5	20	16.7
Nothing	3	7	8	6	24	20

The other constraints 21.7% and 11.7% were poor management and feed shortage of indigenous chickens respectively. This implies that the constraints are almost nearly similar, so the respondents give attention for all the problems.

The major predator and thief in the area were thief (33.3%), wild cat (29.2%), chilfit (23.3%) and shelemetmat (14.2%).this implies that the society suffer from robbery that gone in groups at night and also wild cat (yedur dimet, local name) is a major problem in the area specially at summer when the land covered with crop that enables the wild cat to hind itself from killing by chicken owner. The result is in line with the finding of³¹ that Predators such as birds of prey (locally known as “Cululle”), cats as well as dogs and wild animals respectively in decreasing order were identified as the major causes of village poultry in rift valley of Oromia, Ethiopia. The predation

is strongly associated with the rainy season. The predators include primarily birds of prey such as vultures, which prey only on chicken and wild mammals such as fox,”shelemetmate”, aner (halaro), which prey on mature birds as well as chicks.²³ but it slightly contract with the report listed above since the major predator in the area were thief (robbery) specially at the center of the town. The majority of the chicken owner in the area tries to control the predator by building house (46.7%), fence the surrounding (16.7%), killing measure (16.7%) and nothing was done (20%).

Chicken housing management

During the study at the area the housing system is also conducted with majority of respondents use separate house construction(45.7%) specially kebele 12 and kebele 13 that are cited at the center of the

city that were constructed from metal and wire (30%). 27.7% of respondents use different shelter for night enclosure. like zenbil, sack etc.. (20.8%) and (26.7%) of respondent share the same room with family. These may disagree with report of^{1,21,32,33} who indicated that majority of chicken producers housed chickens by sharing the same room with people. These may be due to inaccessibility of construction material as well as community have no awareness for building of chicken house, though it may cause losses due to thief.

Konicha and Tullu kuche kebele were cited slightly far apart from the city that the community lead their life through agriculture based economy by producing crop (maize, wheat etc) indigenous chicken at that area were housed in the main house and out of the main house constructed from wood and mud (49.2%). However they were constructed chicken houses to protect chickens from predators, rain and wind during night time Table 2.

Table 2 Indigenous chicken housing management in Asella district, Arsi Zone of Oromia, Ethiopia

Variable	Peasant associations (frequency)				Overall frequency	Percentage
	kebele 12	Kebele 13	Konicha	Tullukuche		
Housing system						
Different shelter for night enclosure	9	10	6	8	33	27.5
Separate house	15	17	13	10	55	45.8
Share the same room with family	6	3	11	12	32	26.7
House construction material						
Metal and wire	15	13	5	3	36	30
Others(sack,zenbil,et	5	4	9	7	25	20.8
Wood and mud	10	13	16	20	59	49.2

Veterinary service and health management

Health care is one of the management aspects of indigenous chicken production. To improve productivity of chicken should keep healthy. As indicated in Table 3. There were availability of veterinary clinic around the area (59.2%) and no availability of veterinary clinic (40.8%). even if there were a veterinary clinic at the study area the community use a traditional medicine (45%) like garlic, nim sensel, feto as well as zingibil. This agree with the report of.³⁴ They indicated that traditional medicine made from different plants, spices and others materials, were used in the study area to control disease problems. the respondent that do not use traditional medicine were (55%). The severity of the disease is also conducted in the study area with

the disease that are worse (53.3%) and 25.8%, 15.8% and 5% were getting better, don't know and nothing was happened respectively.

Majority of the respondents get the drug from private drug store (71.7%) and public veterinary clinic (28.3%) with the drug that are administered in their own (67.5%) and 25.8%, 6.7% were with veterinarian and traditional healer respectively. Though treatments were given with veterinarian, traditional healer as well as in their own majority of respondent were not satisfied with its curtness. That was non-effective (63.3%) and effective only (36.7%) this may due to the respondent give the drug after the immune system of the chicken was weak, giving without appropriate dose as well as the disease and the recommended dose were not fit etc Table 4.

Table 3 Veterinary service and health management in indigenous chicken in Asella district, Arsi Zone of Oromia, Ethiopia

Variable	Peasant associations (frequency)				overall frequency	Percentage
	Kebele 12	Kebele 13	Konica	Tullukuce		
Availability of veterinary clinic						
No	5	7	18	19	49	40.8
Yes	25	23	12	11	71	59.2
Use of traditional medicine						
No	18	13	19	16	66	55
Yes	12	17	11	14	54	45
Trend of chicken disease						
Getting better	10	7	4	10	31	25.8
Nothing was happened	2	3	0	1	6	5
Worse	13	15	17	19	64	53.3
Don't know	5	5	9	0	19	15.8

Table Continued

Variable	Peasant associations (frequency)				overall frequency	Percentage
	Kebele12	Kebele13	Konica	Tullukuce		
Source of drug						
Private drug store	21	18	24	23	86	71.7
Public veterinary clinic	9	12	6	7	34	28.3
Drug administration						
Own	19	19	21	22	81	67.5
Traditional healers	0	0	5	3	8	6.7
Veterinarian	11	11	4	5	31	25.8
Treatment effectiveness						
Effective	13	12	7	12	44	36.7
Non-effective	17	18	23	18	76	63.3

Table 4 Indigenous chicken marketing in Asella district, Arsi zone of Oromia Ethiopia

Variable	Peasant associations (frequency)				Overall frequency	Percentage
	Kebele 12	Kebele 13	Konica	Tullukuce		
Months the owner buying chicken						
January-april	7	10	8	10	35	29.2
May-august	8	8	4	3	23	19.2
September-december	15	12	18	17	62	51.7
Place where chicken owner bought their chicken						
From peer friends	4	5	3	8	20	16.7
From the market	21	19	19	12	71	59.2
Nearby village	5	6	8	10	29	24.2
Color preference						
Black(tikur)	0	0	1	0	1	0.8
Gebsima	3	5	9	6	23	19.2
Others	1	0	2	1	4	3.3
Red(key)	11	12	7	13	43	35.8
White(nech)	15	13	11	10	49	40.8
Season of chicken owner sell their chicken						
At any time	3	6	7	9	25	20.8
Bigninig of fasting	4	3	6	2	15	12.5
During religious Celebration	23	21	17	19	80	66.7
Transporting material						
Gari(cart)	2	3	0	3	8	6.7
Hanging with hands	8	9	12	4	33	27.5
Sack	4	5	4	6	19	15.8
Zenbil	16	13	14	17	60	50
For whom do you sell						
Buna bet(hotel owner)	4	1	0	0	5	4.2
Directly to consumer	19	20	19	22	80	66.7
Middle men or collector	7	9	11	8	35	29.2

Chicken marketing system

Majority of respondent bought their chicken at the month of September to December (51.7%). This is due to that the owner bought chicken at these months to hatch to make profit with good prices especially for Christian celebration at holidays and Easter. This in line with the report of³⁵ who indicated that the variation in price mainly attributed to high demand for chickens for Ethiopian New Year and holidays. Also it agrees with the report of,²⁴ Who indicated that the North-west part of Amhara region, Ethiopia, mainly due to the high population of Orthodox Christian religion followers. The owner also bought chicken at these months due to seasonal condition during these months there were excess grain due to crop harvesting, the area specially konicha and tullu kuche were covered with seed as well as grass from at the month may-September it aids the predator to hide itself and cause chicken losses for respondents. Others with 29.2%, 19.2% of respondent bought their chicken at January-April and May-August, respectively. And most of the respondent bought their chicken from market (59.2%), nearby village (24.2%) and from peer friends (16.7%).

Color preference of the respondent also conducted in the study area with majority of respondent (40.8 %) prefer white (nech) and 35.8%, 19.2%, 3.3%, 0.8% of respondent prefer, red (key), gebsima, others and black respectively. Plumage color rather than comb and body condition is an importance in affecting market preference of chickens in the area without any reason but for cosmetic appearance. This in line with the report of,²³ who indicated that Farmers in the Amhara (Farta) and Oromia (Horro) regions give the highest emphasis for plumage color while in the Southern region (Konso and Sheka) live weight is used as the most important selection criteria.

Majority of respondent sell their chicken during religious celebration (66.7%) specially at holidays and Easter and 20.8%, 12.5% of respondent sell their chicken at any time and bigning of fasting (tsume meyasha, local name) respectively. this in line with the report of,³⁶ They indicated that, even if local consumer generally prefer the indigenous birds the high consumption associated only with holydays resulted in the largest off take rates from the flock to occur particularly during holidays and festivals and during the onset of disease outbreaks. In such circumstances, prices fall dramatically due to the high supply compare to demand. That they sold directly to consumer (66.7%), middle men or collector (29.2%) as well as buna bet or hotel owner (4.2%). This report agree with³⁷ who indicated that, The major channels through which producers/farmers sell their chicken in the markets are directly sold to consumers and/or to small retails that take the chicken to large urban centers.

They transport the indigenous chicken with the aid of zenbil (50.0%), hanging with hands (27.5%), sack (15.8%), and gari (6.7%). This agree with the report of,³⁶ who indicated that During transportation the chickens may be kept along with other bags sacks of grain, bundles of firewood etc by binding their legs together that can result in considerable lose due to stressful conditions.

Conclusion

The study was undertaken in four kebeles in and around Asella, capital city of East Arsi zone, Oromia region, Ethiopia. To explore indigenous chicken production constraint and marketing system in extensive management system. So in line with this the main production constraint was identified as disease specially Newcastle disease (NCD), predator, management problem and minimal feed shortage. Even if there were strong measure for predator control, thief, wildcat

and chilfit (chulule) were the major problem encountered in the area.

In the study area majority of people buy their chicken at September-December with different reason and soled at religious celebration with great preference for plumage color specially white and red without considering its body condition and comb type.

So in this point of view I recommended that:

- i. Great effort have to be made to alleviate poultry disease specially Newcastle disease (NCD) with improved management and health care.
- ii. The government should take measure towards thief or robbery that gone at night especially during the incoming religious celebration. in addition to this the people also take different mechanism like cage(shibo, local name) for day time enclosure to control chilfit(chulule) and wild cat.
- iii. Since poultry are highly nutritious, the consumption behavior should not be restricted to religious celebration.

Acknowledgements

The authors would like to sincerely thank to all smallholder farmers at the study area who allowed us their time for interview. We are also grateful to the Addis Ababa University for the provision of thematic research project.

Conflict of interest

There is no any conflict of interest among the authors.

Author's contributions

All author carry equally contribution in whole study.

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