Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.13, No.13, 2023

Management Practices of Chicken Under Village Production Systems in Dandi and Toke-Kutaye Districts of West Shewa Zone of Oromia, Ethiopia

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ABSTRACT
The study was conducted to assess management practices of chicken under village/traditional production systems in Dandi and Toke-Kutaye districts of west Shewa Zone of Oromia, Ethiopia. A total of 180 respondents were randomly selected from six purposively selected kebeles in the study areas based on the accessibility and potential in chicken production. All the collected data were analyzed using SPSS version of 16. The study revealed that majority of the respondents practice traditional scavenging system of chicken production. Regard to feed resource and feeding practices, about 74.44% of the respondents practiced scavenging with additional supplements and 8.33% use only scavenging with no additional feed supplements. The surveyed result revealed that the main sources of water identified in the study areas were rivers, tape water, pond water and holes water. In the study areas, majority (73.3%) of the households were provided supplementary feeds by throwing on the ground which is primitive practices. The major chicken diseases identified in the study areas were New castle disease, Fowl typhoid, Infectious bronchitis, Gumboro and Marek's diseases in order of their importance. Thus, the major chicken management problems in the study areas were alleviated through provision of training for concerned bodies on modern chicken management technologies.
Keywords: chickens, management and traditional
DOI: 10.7176/JBAH/13-13-03
Publication date: August 31st 2023

1. INTRODUCTION

Chicken production has an important economic, social and cultural benefit and plays a significant role in family nutrition in the developing countries. In Ethiopia chickens are the most widespread and almost every rural family owns chickens, which provide a valuable source of family protein and income (Tadelle *et al.,* 2003a).

According to estimates of CSA (2016), Ethiopia has 60.51 million chickens, among which indigenous chicken constitute 94.33% and the remaining 2.47% is exotic and 3.21% hybrid chicken. Oromia stand first in chicken population in Ethiopia with about 20.71 million (36.5%) chicken and West Shewa Zone is among the top three zones producing chicken in the region.

Despite the high number, their contribution to farm households and national income is still very low (2-3%) and the annual growth rates in egg and meat output were estimated at about 1.0 and 2.6% as compared to the sub Saharan Africa countries, 5.7 and 6.8%, respectively (Negussie, 1999). The country has diverse agro-climatic conditions favoring production of many different kinds of crops, providing a wide range of ingredients and alternative feedstuffs suitable for chicken feeding.

Family poultry production in Africa survives by scavenging and generally, no supplements provided except that sometimes, household waste fed to the birds and other circumstances the diet supplemented with grain (Dwinger *et al.,* 2003). Similarly, in Ethiopia the traditional chicken production system is characterized by keeping under free range system and the major feed sources are believed to be insect, worms, seed and plant materials (Tadelle and Ogle, 1996a; Solomon, 2004). The birds find their feed by scavenging around the houses in the village, and in addition, they might get leftovers from the harvest.

Although no data are available about housing at national level, the local birds are set free on free range whereby they move freely during the day and spend the night in the main house. Overnight housing, perched in trees or on roofs and overnight housing within the main house are the common patterns of housing prevailing in the country (Tadelle, 2003).

Under village chicken production, prevailing diseases, predators, lack of proper health care, poor feeding and poor marketing information were reported as constraint (Moges *et al.,* 2010a; Dinka *et al.,* 2010 and Mengesha *et al.,* 2011). The high mortality of chicks under village chicken production in the central highlands of Ethiopia is due to diseases, parasites, predation, lack of feed, poor housing and insufficient water supply (Tadelle, 2001). Among the infectious diseases, Newcastle disease, salmonellosis, coccidiosis and fowl pox are considered to be the most important causes of mortality in local chicken while predators are also reported to be an additional causes of loss chickens in Ethiopia (Eshetu *et al.,* 2001).

West shewa zone of Oromia regional state of Ethiopia is one of the top producers of chickens and farmers in the study areas were highly participated on chicken production as additional income sources next to crop and livestock. However, the management provided for chicken was not well investigated and documented in west shewa zone in particular and in Oromia in general.

Therefore, the main objective of the present study was designed to assess different management practices offered for chickens in the selected districts of west Shewa zone of Oromia, Ethiopia.

2. MATERIALS AND METHODS

2.1. Description of the Study Areas

The study was conducted in Dandi and Toke-Kutaye districts of West Shewa zone, Oromia, Ethiopia. Dandi district is located at 78km from Addis Ababa in the western direction and has an altitude ranges from 1600 to 3268 meters above sea level. The mean annual temperature of the area ranges from 9.3–23.8^{0}c. The district has 500-1172 mm annual rain fall. Dandi district has highland (71%) and midland (29%) agro-ecologies. In the district, about 114,176 chickens are found of which 108,468 are local breeds and 5,708 are improved/exotic breeds (Dandi District Livestock and Fishery Development Office, 2015).

Toke-Kutaye district is located at 126 km from capital city of the country Addis Ababa and 12 km from the zonal town, Ambo in the western direction. This district has an altitude ranges from 1580-3190 m.a.s.l and mean annual temperature of 10-29^{0}c. The annual rain fall of the district ranging from 800-1100 mm. Agro-ecologically the district has highland (27%), midland (55%) and low land (18%). About 84,590 chickens are found of which 80,360 are local breeds and 4,230 are improved/exotic breeds (Toke-Kutaye district Livestock and Fishery Development Office, 2015). Village/traditional scavenging chicken production system is a common chicken production system in the study areas.

2.2. Data Collection

2.2.1. Household selection and sampling techniques

Six kebeles (3 from each district) were purposively selected based on the potential for population of chickens and accessibility of the study areas.

Accordingly, Yubdo laga batu, Warqa warabo and Faji Galila kebeles from Dandi district and Naga file, Malka Nagaf Dambi and Emela Dawe Ajo from Toke-Kutaye district were selected. Farmers who participated in chicken productions were listed down and taken as a sampling frame. A total of 180 chicken producers households (90 household from each district) were randomly selected from the two districts.

2.2.2. Sample size determination

The total households included in the study areas were determined according to the formula given by Yamane (1967) for homogenous experimental material, with 92 percent confidence level.

$$n = \frac{N}{1+N(e)^2}$$

Where, n=designates the sample size
N=designates total number of households
e= designates maximum variability or margin of error =8% (0.08)
1=designates the probability of the event occurring

Table 1: Sample size determination

Name of selected kebeles	Total number of households who own chicken	Sampled households
Dandi district		
Yubdo Laga Batu	30	~25
Warqa Warabo	56	~41
Faji Galila	43	~ 33
Total sampled households	**-**	**~ 99 = 90**
Toke-Kutaye district		
Naga File	49	~34
Malka Nagaf Dambi	34	~27
Emala Dawe Ajo	41	~32
Total sampled household	**-**	**~93 = 90**

2.2.3. Data sources and collection methods

Both primary and secondary data were used for this study. Secondary data (like total number of chickens, mortality rate and health care) were obtained from Dandi and Toke-Kutaye districts Livestock and Fishery Development office annual and quarterly reports.

Primary data were collected by formal interview methods using semi structured questionnaires. The type of data collected among others were mortality rate, feeding practices and types of feeding and healthcare related to

chicken production. In addition, 'Focus Group Discussion' (FGD) and key informant interview also made to grasp some cross-cutting issues on chicken management.

2.2.4. Data analysis

All the quantitative and qualitative data collected were entered in to Microsoft excel spreadsheet and analyzed using Statistical Package for Social Science (SPSS) version 16. Then descriptive statistics such as percentages, mean and standard error were used to present the data. To test the difference among the sub systems on a certain variable chi-square test were employed.

3. RESULTS AND DISCUSSION

3.1. Household Profile of the Respondents

The household profiles of the respondents in the study areas in terms of sex, age and educational status are presented in Table 2 and Figure1.

3.1.1. Sex and age of the respondents

Result of the study revealed that the proportion of male respondents (85%) was greater than female respondents (15%). From the total respondents, 32.7% (18-30 years), 55% (31- 60 years) and 12.2% (> 60 years) were youth, adult and old age categories, respectively, which indicates that about 87.7% of the respondents were within the productive age category (18-60 years), which has significant contribution in chicken production where the demand for labour is high.

3.1.2. Educational level of the respondents

The educational status of the respondents ranged from illiterate to those completed college and university. Out of the total respondents (Fig.1), about 30.6% attained elementary school education while 22.2% were illiterate. About 25, 21.1 and 1.1% of the literate respondents had gone through read and write (adult education), high school, college and university, respectively. The current finding is not in line with the report of Fisseha *et al.* (2010) who reported 39.3 and 6.9; 31.1 and 28.1; 21.4 and 44.2; 8.2 and 27.4% were illiterate, reading and writing, primary education, and secondary education and above in Bure and Dale, respectively.

This result showed that in areas where there is high proportion of educated respondents, the use of modern chicken production and consumption was also high. This indicated that education has a paramount importance for the adoption of modern agricultural techniques in general and that of chicken sector in particular. In general, the level of education of chicken farmers is a pivotal factor in determining household income, adoption of new technologies, demography, health and the overall intensification of smallholder chicken production and hence improvement of the livelihood.

Table 2: Sex and age of the respondents in the study areas

Variables	Districts					
	Dandi		Toke –Kutaye		Over all	
	number	%	number	%	number	%
Sex of the respondents						
Male	78	86.7	75	83.3	153	85
Female	12	13.3	15	16.7	27	15
Age of the respondents(years)						
15-30	27	30	32	35.6	59	32.7
31-60	50	55.6	49	54.4	99	55
Above 60	13	14.4	9	10	22	12.2

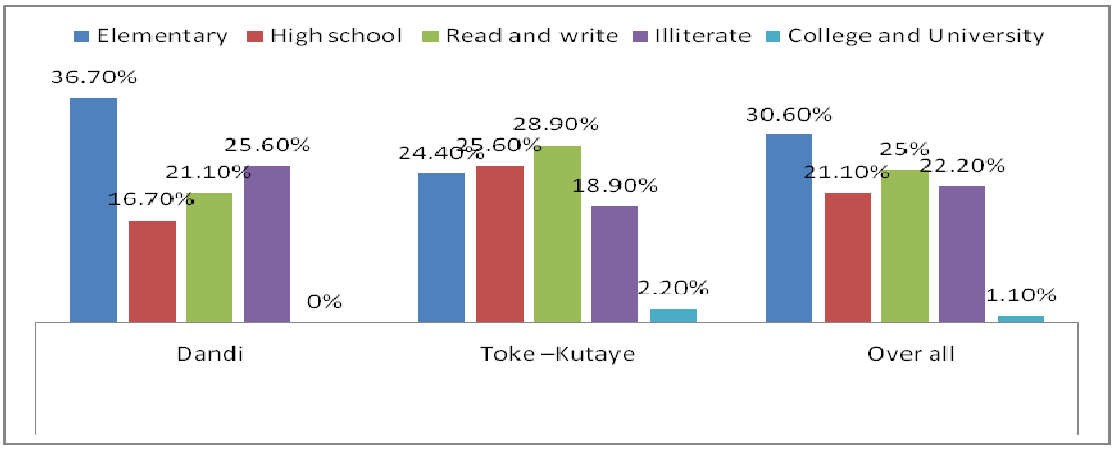

Figure 1: Educational level of the respondents

3.2. Management Systems of Chicken in the Study Areas

3.2.1. Chicken production systems of the study districts

In the study areas, majority of the farmers (65%) practice the traditional scavenging system of chicken production. The results of the study (Fig. 2) showed that the dominant chicken production system was a free range scavenging or extensive type, utilizing various feed sources searching by their own in the field, with conditional feed supplementation. During the rainy season, mostly the chickens fed different types of insect, worms and leaves of different vegetables and grasses sown at the garden because there is shortage of grain yet for human being. The input offered for the chickens and the output harvested is low. The quality and quantity of the products obtained from scavenging system of production is also poor compared to the semi-intensive or intensive chicken production systems.

From total sample size, about 21.1 and 34.4%; 10 and 3.33% of the respondents kept chickens in semi-intensive and intensive in Dandi and Toke- Kutaye districts, respectively. This implies that farmers in the study areas are going to change and improve chicken production system and management practices like provision of improved health care, commercially formulated feed and separate poultry house. This proportion is almost nearest to the report of Melese and Melkamu (2014) who reported 83.3% and 16.7% of the respondents reared chickens in extensive and semi-intensive systems, respectively. Melkamu and Andargie (2013) also reported that the type of management system is commonly extensive (71.66%), semi-intensive (23 to 33%) and intensive (5%) in Enebsie Sar Midir Woreda, Eastern Gojjam. Similarly, Moreda *et al.* (2013) reported that in South west and South part of Ethiopia, the management system provided for chickens was extensive (71.6%) and semi-intensive (28.4%).

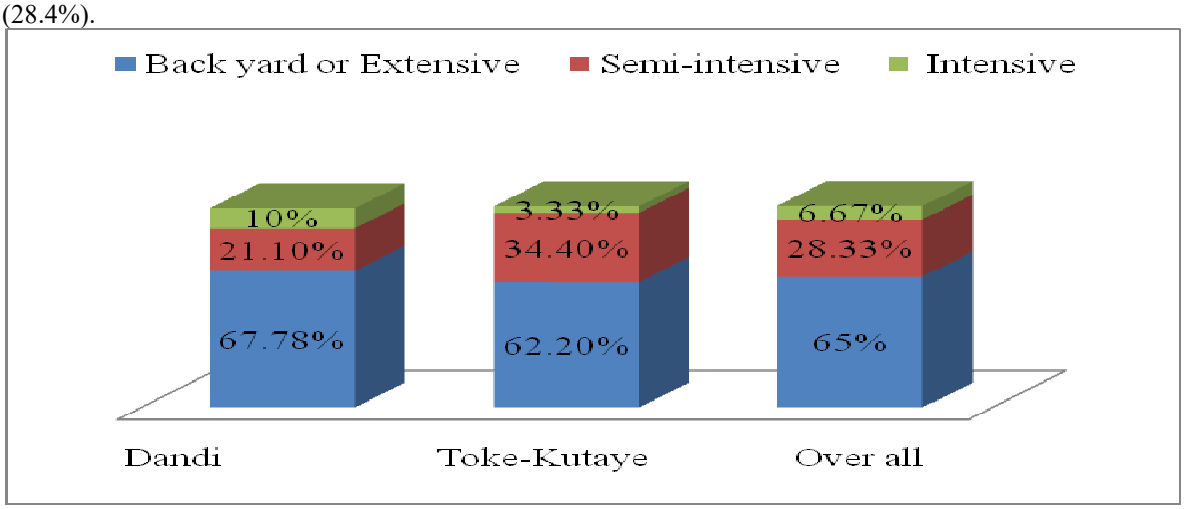

Figure 2: Chickens production systems of the study districts

3.2.2. Feed resources and feeding practices of chickens

The major feeds and feeding practices of chickens and the methods of provision of supplementary feeds in the study areas are summarized in Table 3 and 4.

Result of the study revealed that about 74.44% of the respondents practiced scavenging with additional supplements and 8.33% use only scavenging with no additional feed supplements. From the total sample size, only 11.7 and 5.6% of the respondents provide homemade and purchased commercial feeds for their chickens, respectively. This finding is in line with the report of Desalew (2012) who reported that 97.8% of the respondents were using scavenging with additional supplements, 2.8% using purchased feed and 2.2% using only scavenging. Nigussie *et al.* (2010) also reported that 83% of the farmers use scavenging and supplement, and 17% use only scavenging in Ethiopia. But the present finding is at par with that of Wondu *et al*. (2013) who reported about 55, 33 and 12% households involved scavenging only, scavenging and grain supplementation and provided refusals as supplementary feeds, respectively.

In the study districts, about 71.1% of the farmers reported that they provided locally available cereal grains (wheat and maize) as supplementary feed for chickens. But the amount of supplement varies depending on seasons of the year and the quantity and availability of the resources at the household level. Similarly Desalew (2012) reported that 95% of the farmers in east Shewa offer wheat and maize as supplement. Regarding feeding frequency, 58.3, 22.2 and 9.44% of the respondents offered supplements for chickens twice a day (morning and afternoon/evening), three times per day (morning, afternoon and evening) and once per day (morning only), respectively. This result is in line with the report of Meseret (2010) who reported about 48.3, 22.2 and 18.3% of surveyed household in Gomma offer supplement twice a day (morning and afternoon), three times per day (morning, afternoon and evening) and once per day, respectively. Addis and Malede (2014) also reported that 27.78, 18.89, 34.44 and 7.78 % of the farmers provided supplement three times per day (morning, afternoon and

evening), twice per day (morning and evening), once per day (morning only and afternoon only) and no feeding, respectively. About 52.2% of the surveyed households offer each ingredient of grain supplement alone and 39.44% of them provided a mixture of different grain supplement in the study districts (Table 3).

Table 3: Feed resources and feeding systems of chickens

Variables	Districts					
	Dandi		Toke-Kutaye		Overall	
	number	%	Number	%	number	%
Feeding practices of chickens						
Scavenging only	9	12.2	6	6.7	15	8.33
Scavenging with supplement	60	64.4	74	82.2	134	74.44
Purchased concentrate feed	9	10.0	1	1.1	10	5.6
Homemade feed	12	13.3	9	10.0	21	11.7
Time of feed supplements						
Morning only	11	12.22	6	6.67	17	9.44
Morning and evening	13	14.4	22	24.4	35	19.4
Morning and afternoon	33	36.7	38	42.2	71	39.4
Morning, afternoon and evening	24	26.7	18	20	42	23.3
Types of grain used for supplement						
Maize	13	14.4	7	7.8	20	11.1
Wheat	7	7.8	9	10	16	8.9
Maize and Wheat	60	66.7	68	75.56	128	71.1
Others	1	1.1	-	-	1	0.6
Frequency of supplementing per day						
Once	11	13.3	6	8.9	17	9.44
Twice	46	51.1	60	66.7	106	58.9
Three times	24	26.7	16	17.78	40	22.2
Form of grain supplemented						
Mixture of different ingredient	35	38.9	36	40	71	39.44
Each ingredient alone	46	51.1	48	53.3	94	52.2

As indicated in table 4, majority (73.3%) of the households in the study districts provide supplementary feeds by throwing on the ground. Group feeding is practiced by most (84.4%) of the surveyed households. Only 5.6 and 1.7 % of the surveyed households separate chicken by sex and age, respectively during supplementary provision. Group feeding has its own effect on the growth and productivity performance of very young chickens and weak layers. However, some of the farmers 16.67 and 1.7%, who mainly practice semi-intensive and intensive type of chicken management, use locally available and modern feeding trough to provide supplementary feed, respectively.

In study areas, about 96.1% of the interviewed farmers were not adding salt or limestone when they offer grain supplement for chickens. This has its own influence on egg quality. Chickens which fed grains that have mineral deficiency might be produce eggs with thin egg shell or eggs without shell coverage. Only 3.89% of the respondents were adding mineral to the grain supplement they provided for their chickens (Table 15). This is in agreement with the report of Desalew (2012) who reported provision of mineral supplement was practiced only by few households (2.2%) in Ada'a and Lume districts.

Table 4: Methods of provision of supplementary feeds for chickens in the study districts

Variables	Districts					
	Dandi		T/Kutaye		Overall	
	number	%	number	%	number	%
Methods of provision of supplementary feeds						
Using locally available feeding trough	11	12.2	19	21.1	30	16.67
Throwing on ground	67	74.4	65	72.2	132	73.3
On modern feeding trough	3	3.3	0	0	3	1.7
Ways of feeding chickens						
Group feeding	68	75.6	84	93.3	152	84.4
Feeding by separating in age	2	2.2	1	1.1	3	1.7
Feeding by separating in sex	10	11.11	0	0	10	5.56
Mixing salt or limestone during grain supplements						
Yes	5	5.6	2	2.22	7	3.89
No	85	94.4	88	97.8	173	96.1

3.3.3. Frequency of watering chickens

In the families of 56.7 and 62.2% surveyed households water was provided with free access for chickens in Dandi and Toke-Kutaye districts, respectively (Table 5). On the other hand, about 27.8 and 26.7%; 15.6 and 11.1% of the respondents provide water for chickens twice a day (during morning and evening time); and morning time only in Dandi and Toke-Kutaye districts, respectively. But majorities (59.4%) of the households offered water for chickens with free access in the study areas. This result is at par with that of Bikila (2013) who reported 65.8, 19.2 and 15% of the respondents provided water for chickens twice/day, once/day and every other day, respectively without free access.

The main sources of water identified in the present study areas were rivers, tape water, pond water and holes water. The majority (49.4%) of the households in the study area obtained water from rivers, while 22.22% from pond and the rest from other sources. This result is agreement with the finding of Melese and Melkamu (2014) who reported that 36.7, 39 and 23.3% of the farmers obtain water for their chickens from river, pond and deep well water and tap water in east Gojjam zone, Amhara regional state, respectively. Bikila (2013) also reported that 90, 5.8 and 4.2% of the respondents obtained water for their chickens from river, rain and well water in Chelliya district, respectively.

As can be evident from table 5, about 67.2% of the respondents use part of plastic equipment as watering trough for their chicken, while 26.7% of the respondents used broken part of clay for watering purposes. This result is in line with the result of Melese and Melkamu (2014) who reported that 42.2% of the respondents use part of plastic equipments to provide water for chickens.

Table 5: Frequency and source of water used for chickens in Dandi and Toke-Kutaye districts

Sources and frequency of watering	Districts					
	Dandi		T/Kutaye		Overall	
	number	%	number	%	number	%
Frequency of watering chickens						
Free access	51	56.7	56	62.2	107	59.4
Only morning	14	15.6	10	11.1	24	13.3
Morning and evening	25	27.8	24	26.7	49	27.2
Sources of water for chickens						
Hole water	6	6.7	20	22.2	26	14.4
River	54	60	35	38.9	89	49.4
Tap water	18	20	6	6.7	24	13.3
Pond water	11	12.2	29	32.2	40	22.22
Well water	1	1.1	-	-	1	0.55
Water trough used for water provision for chickens						
Broken part of clay	27	30.0	21	23.3	48	26.7
Part of plastic equipments	56	62.2	65	72.2	121	67.2
Purchased watering trough	1	1.1	-	-	1	0.6
Adding on ground hole	6	6.7	4	4.4	10	5.6

3.2.4. Chicken housing systems and cleaning in the study area

Type of housing has its own consequence on chicken production and productivity. As can be noticed from the present study, about 51.1, 32.8, 10.6 and 5.6% of respondents were share the same house with chickens, constructed separate house for chicken, kept in kitchen and kept on perch under the roof, respectively. Entire respondents were not keep chickens in cage system in the study districts. This reflects adoption of modern chicken housing is weak in the study districts. Similar proportions of housing methods was reported by Bikila (2013) who reported that 53.3% of the respondents shared the same room with chickens, 33.3% constructed separate house for chicken and 13.3% of the respondents have different shelter during night in the same room for chickens while different proportions of housing methods reported by Samson and Endalew (2010) who reported that 58% of the surveyed households of mid-rift valley of Ethiopia keep chickens in main house, 26.6% on perch and 14 % in separate sheds made for chickens.

Regarding chicken house cleaning frequency, about 72.2 % of the households were clean the chickens' house daily, whereas 15.6 and 2.79% of the chicken owners clean the houses weekly and monthly, respectively (Table 6). Lack of frequent cleaning of chicken shelter might cause disease and increase morbidity and mortality rates of chicken. Thus, raising awareness of farmers on the need for cleaning shelters is important. In addition to diseases prevalence, the quality of the product obtained from dirty house is poor. Similarly Melese and Melkamu (2014) have reported that 65.6 % of surveyed households of East Gojjam clean chicken house daily. Matiwos *et al. (*2015) also reported that majority of the respondent's clean chicken house/shelter daily (85.7%), while the remaining (14.3%) clean weekly in Amaro district of Ethiopia.

Table 6: Chicken housing system and frequency of cleaning in study areas

Chicken housing system	Districts					
	Dandi		Toke-Kutaye		Overall	
	number	%	number	%	number	%
Share the same house with people	53	58.9	39	43.3	92	51.1
Separate house constructed for poultry	25	27.8	34	37.8	59	32.8
Kitchen	8	8.9	11	12.2	19	10.6
Perch under the roof	4	4.4	6	6.7	10	5.6
Cage	-	-	-	-	-	-
Frequency of cleaning						
Daily	68	75.6	62	68.9	130	72.2
Weekly	8	8.9	20	22.2	28	15.6
Monthly	4	4.4	1	1.1	5	2.79
Once in two days	10	11.1	7	7.8	17	9.44

3.2.5. Seasons of egg incubation and methods of egg identification

The present study indicated that exclusively natural incubation and hatching is practiced in the study districts. Result of the study revealed that about 82.2 and 81.1% of the respondents incubate the eggs during dry season in Dandi and Toke-Kutaye districts, respectively (Table 7), whereas, only few (14.4 and 17.8%) and (3.3 and 1.1%) of farmers incubate at any time of the season; and during wet season in Dandi and Toke-Kutaye districts, respectively. The current result is at par with the finding of Samson and Endalew (2010) who reported that 54 and 42% of the respondents incubated eggs at any time and during dry season, respectively.

Majority of surveyed households reported that they have traditional practices by which they identify whether the eggs is spoiled or not before incubation to increase hatchability percentage. As it is indicated in table (Table 7), majority (24.44%) of the respondents identify whether the egg is spoiled or not by shaking. Nevertheless, sizable proportions of the respondents (21.7%) identify by sun candling. The proportions of identification methods are not similar to the results of Samson and Endalew (2010) who reported about 39, 33 and 28% farmers identify eggs used for incubation by sun candling, shaking and putting in water, respectively.

Table 7: Seasons of egg incubation and methods of egg identification

Variables	Districts					
	Dandi		Toke-Kutaye		Overall	
	number	%	number	%	number	%
Season of eggs incubation						
Wet season	3	3.3	1	1.1	4	2.2
Dry season	74	82.2	73	81.1	147	81.7
Any time	13	14.4	16	17.8	29	16.1
Identifications of eggs for incubation						
Yes	46	51.1	56	62.2	102	56.7
No	44	48.9	34	37.8	78	43.3
Methods of eggs identifications weather it is spoiled or not used for incubation						
Putting in water	5	5.6	0	0	5	2.8
Sun candling	18	20.0	21	23.3	39	21.7
Shaking	22	24.4	22	24.4	44	24.44
Sun candling and shaking	1	1.1	13	15.6	14	7.78

3.3.3. Chicken health management

3.3.3.1. Major diseases of chicken and times of occurrences

The major diseases of chicken in the study areas are shown in Table 8. Accordingly, the study showed that the major chicken diseases are Newcastle disease (NCD), fowl typhoid, infectious bronchitis, Gumboro and Marek's disease in their order of importance. This result clearly showed that there were many chicken diseases existing in the study districts. It is obvious that disease impacts chicken production in many ways such as reduced body weight, reduced growth rate, low egg and meat production, low reproductive performance, high mortality and treatment cost. Poor housing, climatic condition, poor nutritional status and low level of management contributed to a high incidence of chicken diseases in the areas. On top of that the insufficient veterinary service and absence of scheduled vaccination seemed the major bottlenecks that need to be solved by concerned body to utilize the potential of the study areas. The problem chicken diseases raised in the study areas is in agreement with the report of Matiwos *et al.* (2015) who reported Newcastle (Wararshe/Fengel), fowl cholera (cholera) and salmonella (kisen) were the major diseases affecting chickens in Amaro district, SNNPRS of Ethiopia and Bikila (2013) also reported that the major diseases in order of their importance were 85% Newcastle disease (NCD) and

15% other diseases (Coccidiosis, Fowl pox and Fowl typhoid) in Chelliya district.

Table 8: Major poultry diseases in the study districts

Variables	Districts					
	Dandi		Toke-Kutaye		Overall	
	number	%	number	%	number	%
Vaccination provided against						
Newcastle diseases	25	27.8	4	4.4	29	16.1
Marek's disease	1	1.1	-	-	1	0.6
Fowl typhoid	6	6.7	8	8.9	14	7.8
Gumboro	1	1.1	-	-	1	0.6
Infectious bronchitis	1	1.1	2	2.2	3	1.7
New Castle and Fowl typhoid	6	6.7	4	4.4	10	5.6
Diseases that mainly affect chickens						
Newcastle diseases	64	71.1	20	22.2	84	46.7
Marek's disease	2	2.2	1	1.1	3	1.7
Fowl typhoid	14	15.6	38	42.2	52	28.9
Gumboro	4	4.4	-	-	4	2.22
Infectious bronchitis	-	-	6	6.7	6	3.3
New Castle and Fowl typhoid	6	6.7	5	5.6	11	6.1

3.3.3.2. Chicken vaccination in the study districts

Chicken disease is one of the challenging issues for chicken development in the study areas. Diseases cause severe economic loss in chicken production. The loss is not only due to the death of chickens but also due to loss in production.

In the study areas, about 72 and 55.6% sample household from Toke-Kutaye and Dandi districts, respectively did not vaccinate their chickens and only 44.4% of respondents in Dandi and 20% in Toke- Kutaye district vaccinated their chicken. The chi-square analysis indicated a statistical significant difference ($p<0.05$) in use of vaccines against chicken diseases between the two districts. This difference could be created between the study districts due to availability of veterinary services and provision of extension services for the farmers. This finding is in line with the report of Desalew (2012) who reported majority of the respondents (78.8%) in Ada'a district did not vaccinate chickens, but disagree with the finding of the same author who reported most of the respondents (80%) in Lume district vaccinated their chickens. Nigussie *et al.* (2010) also reported that 95% of the farmers in Ethiopia were not vaccinating their chickens while only 5% of them provided vaccination.

Table 9: Annual poultry vaccination practices in the study districts

Variables	N	Vaccinated		Not vaccinated		X^2	P
		number	%	number	%		
Districts						22.76	< 0.05
Dandi	90	40	44.4	50	55.6		
Toke –Kutaye	90	18	20	72	80		
Total	180	58	32.22	122	67.78		

3.3.3.3 Methods of sick chicken treatment and places of treatment in the study areas

It was noticed from the present study that, majority of the respondents had different treatment methods when sick birds were observed in the flock. Accordingly, about (85.55 vs 75.6%) of the respondents reported that they medicate sick chickens in Dandi and Toke-Kutaye, respectively. However, about 6.67 and 11.1%; 7.78 and 13.3% of the surveyed household reported that selling and isolation of sick chickens was another treatment method in Dandi and Toke-Kutaye, respectively. Similarly, Nebiyu *et al.* (2013) reported that the measures taken by farmers when sick chickens observed in the flock were medication (90%), selling (6.8%) and isolation of chicken (3.2%).

The majority of farmers reported that they have treatment places when their chicken was sick in the flock. Thus, of the total households 43.3% of the respondents were treated sick chickens at home by traditional treatment methods. The respondents used traditional treatment due to lack of enough knowledge about the advantage of modern drug, accessibility and low prices of traditional treatment and unavailability of veterinary services at their locality.

But those farmers who know the negative impact of traditional treatment on the health of chickens treated at animal health posts and veterinary clinics. Therefore, about 32.2% of the respondents reported that they treat sick chicken at animal health post (health institution organized at kebele level) and 5% of the respondents treat at veterinary clinics (health institution organized at woreda level).

The traditional materials used for treatment of sick chickens reported by respondents were garlic (Qullubbii adii), lemon juices (cuunfaa Loomii), local beverage (araqee/Katikala), Juice of Eucalyptus leaf (cuunfaa baala

baargamoo) and Juice of Demakese leaf (cuunfaa baala hancabbii) in both districts. Other respondents reported pepper powder as traditional drug to treat their chickens. According to the response of the respondents, the amount of traditional drug used for sick chicken treatment was not measured and known. This might have impact on the health status of the chickens. In addition to traditional treatment, some respondents used treatments that ordered for human being for sick chickens. The current result is in line with the report of Samson and Endalew (2010) who reported farmers in mid rift valley of Oromia, use garlic, different green leaves like 'Bala Ganate', lemon, local alcohol, paper powder, butter as drenching, nasal application and smoking to treat sick chickens and Fisseha *et al*. (2010) also reported the provision of a mixture of local alcohol ('Arekie'), lemon and onion to sick birds against NCD was the most widely used type of traditional treatment.

Among traditional users 30 and 33.3% of respondents in Dandi and Toke- Kutaye, respectively administer traditional treatment for sick chickens by mixing with injera (human food) while 13.3% of respondents of Dandi district and 8.9% of respondents from Toke- Kutaye administer traditional treatment for sick chickens orally in liquid. Only very few farmers (0.6%) from Dandi district reported provision of traditional treatment through smoking for chickens.

Table 10: Sick chicken treatment and places of chicken treatment

Variables	Districts					
	Dandi		Toke-kutaye		Overall	
	number	%	Number	%	number	%
Measures against diseases						
Medication	77	85.55	68	75.6	145	80.56
Selling	6	6.67	10	11.1	16	8.89
Isolation	7	7.78	12	13.3	19	10.56
Place of sick chickens treatment						
Animal health posts (kebele level)	34	37.78	24	26.7	58	32.2
Veterinary Clinics (woreda level)	3	3.33	6	6.7	9	5
At home by traditional medicine	40	44.4	38	42.2	78	43.3
Traditional material used for treatment						
Juice of Eucalyptus leaf	2	2.2	4	4.4	6	3.33
Juice of Demakese leaf	3	3.3	-	12.2	3	1.67
Lemon juice	11	12.2	11	15.6	22	13.9
Garlic	12	13.3	14	15.6	26	15.6
Arake/Katikala	9	10	8	8.89	17	9.44
pepper powder	3	3.3	1	1.1	4	2.2
Traditional treatment methods						
Orally in Liquid form	12	13.3	8	8.9	20	11.1
Mixing with injera	27	30	30	33.3	57	31.67
Smoking	1	1.1	0	0	1	0.6

3.3.3.4. Season of disease outbreak and chicken breeds more affected in the study areas

As can be seen from Table 11, about 76.7% of the respondents in Dandi and 72.2% in Toke- Kutaye district reported that, the majority of the chicken diseases occur during rainy season. This might be due to the self multiplication of micro organisms which causes chicken disease and rising of bad smell from different sources. However, about 23.3 and 4.4% of the households reported that chicken diseases outbreak occurs during dry season in Dandi and Toke- Kutaye districts, respectively.

The result of the study revealed that, about 54.4 and 77.8%; 42.2 and 13.3% of the households reported that diseases mainly affect young age chickens and all age chicken groups in Dandi and Toke-Kutaye districts, respectively. This finding is in agreement with the report of Matiwos *et al*. (2015) who reported all age chicken groups (67.4%) equally affected by diseases. Results of the study also revealed that about 81.1% of household respondents in Dandi and 86.7% in Toke- Kutaye district reported as improved/exotic chicken breeds were more susceptible for diseases when compared with local breeds.

Table 11 : Season of disease outbreak, chicken age group and breeds more susceptible for diseases in the study districts

Variables	Districts					
	Dandi		Toke-kutaye		Overall	
	number	%	number	%	number	%
Season of chicken diseases out break						
Dry season	21	23.3	4	4.4	25	13.89
Rainy season	69	76.7	85	72.2	154	85.56
Any season	-	-	1	1.1	1	0.6
Chicken age group mostly affected						
Young chicks	49	54.4	70	77.8	119	66.1
Adult chicks	3	3.3	8	8.89	11	6.11
All age group	38	42.2	12	13.3	50	27.8
Chicken breeds more susceptible						
Local	17	18.9	12	13.3	29	16.1
Improved/exotic	73	81.1	78	86.7	151	83.9

3.3.3.5. Methods of dead chickens disposal

Table 12 presents, the main action taken by farmers to prevent and control the emerging diseases was disposal of dead chickens. The household respondents disposed dead chickens by different methods in the study districts. As a result, about 70 and 60%; 20 and 12.2%; 8.9 and 4.4%; and 1.11 and 1.11% of the respondents disposed dead chickens by throwing on open air, give to pet animal, burning and burying in Dandi and Toke-Kutaye district, respectively. It indicates majority of the respondents dispose dead body of chickens by throwing on open air. This ways of disposal could have environmental impact by polluting air and water and could also route for disease transmission. Burning of dead body of the chickens is not purposely acted. The respondent's burn dead chickens unexpectedly by gathering with other wastes. Very few respondents bury dead chickens based on consultation obtained from veterinarians. The present finding is at par with the report of Nebiyu *et al.* (2013) who reported dead chickens are disposed by feeding pet animals (86.8%) and burying (13.2%).

Table 12: Methods of dead chicken disposal in Dandi and Toke-Kutaye district

Variables	Districts					
	Dandi		Toke-kutaye		Overall	
	number	%	number	%	number	%
Measures taken to dispose dead chickens						
Thrown on open air	63	70	54	60	117	65
Burning	8	8.9	4	4.4	12	6.67
Burring	1	1.11	1	1.11	2	1.11
Given to pet animal	18	20	11	12.2	29	16.11

3.3.3.6. Major chicken predators of the study districts

Predators were the major causes of chicken lose next to diseases in study districts. As can be seen from Table 13, the major predators that affect chickens in the study areas were cats, rats and dogs; prey of birds; and other animals like honey badger and 'soyanbissa'. Cats, rats and dogs were reported by 51.1% of respondents in Dandi and 53.3% in Toke-Kutaye as major chicken's predators. Prey of birds in Dandi (44.4% of the respondents) and Toke-Kutaye (36.7% of the respondents) were also reported as the second chicken's predators. In contrary insignificant proportion of surveyed households (7.2%) reported that other animals like honey badger and 'soyanbissa' as additional predators of chicken. The current result is agreement with the report of Wondu *et al.* (2013) who reported that the predators like cat and predator birds (64%) and dogs (7%) cause chicken losses.

Table 13 : Major chicken predators in the study areas

Variables	Districts					
	Dandi		Toke-kutaye		Overall	
	number	%	Number	%	number	%
Main chicken predators (%)						
Prey of birds	40	44.4	33	36.7	73	40.6
Cats, Rats and Dogs	46	51.1	48	53.3	94	52.2
Honey badger and 'Soyanbissa'	4	4.4	9	10.0	13	7.2

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

The study was conducted with the overall objective to assess management practices of chicken under

village/traditional production system in Dandi and Toke-Kutaye districts of west Shewa Zone of Oromia, Ethiopia. A total of 180 respondents were randomly selected from six purposively selected kebeles in the study areas. All the data collected were analyzed using SPSS version 16.

In the study areas, high proportion of chicken mortality was caused due to high prevalence of chickens diseases and predators. The study revealed that the main feed resources for chicken were scavenging with additional supplements. But only few percentage of the respondents use commercial chicken feed. The study showed that incubation of egg was practiced during dry season of the year. As result of the survey revealed, farmers in the study areas use their own indigenous knowledge for egg candling during incubation.

The major chicken diseases reported in study areas in the order of their importance were New Castle Disease, fowl typhoid, Gumboro and Marek's disease. Despite the frequent prevalence of diseases most of the surveyed households were not vaccinate their chicken. Generally, it can be concluded that the management given for chickens in the study districts were still primitive.

4.2. Recommendations

The following recommendations are suggested based on the result of the current study:

- Government, researchers and developmental organizations should give due attention for the management of chicken.
- Training for farmers and extension staffs focusing on diseases control, improved housing, feeding and proper data recording should be the focus of intervention in the future.
- Government should establish chicken health posts at different rural kebeles with full facilities and high performing professionals to provide wide spread vaccination against major diseases in the study areas.

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