

Sanitation and Health status of SassoT44 Chickens under Traditional Production System in North Shewa Zone, Amhara Region, Ethiopia

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Abstract

The study was conducted in three districts of North Shewa Zone, Amhara Region, Ethiopia. The districts were selected based on three agro-ecologies (highland, midland and lowland). From these districts, a total of nine kebeles were purposively selected. A simple random sampling was employed to select the respondents in each kebele who have four and above exotic chickens. Cross-sectional study design was used to assess the sanitation and health status of Sasso T44 chickens. The results revealed that about 55.4% of the respondents cleaned their chicken's house. However, only 16.6 % of the respondents used disinfectants to disinfect the chicken house. The major disease reported in the study area was Newcastle disease (70.77%) due to less vaccination practice against the disease. Throwing of dead chicken were the main disposal method for the respondents (66.46%). Only 27.69% of the respondents practiced chicken vaccination at least for one disease. Therefore, from this study we concluded that the sanitation and health care practices undertaken in the study area is not fully exploited. Hence, to overcome the current situations, training about sanitation and health control mechanism is needed to improve poultry production.

Key words: Disease; health; Sasso T44 chickens; Vaccination;

Introduction

Poultry production plays a vital role for food security and contributes to the Ethiopian economy [1]. It demands small investment compared to other livestock species [2]. Due to the high population growth, the demand for eggs and poultry meat has significantly increased in recent years across large parts of the country. In Ethiopia, there was also a strategy stated that the commercial production system of chicken be expanded to fulfill the increased demand for chicken meat and egg [3], which is the major organization mandated with poultry extension work. Exotic chickens were facilitating proper management practice for good egg and meat production. [4] Suggested that provision of shelter, regular supplies of clean drinking water, care chicken health states and supplementary feeding would improve growth and reproductive rates and greatly increase survival of chicken

production. Nutritional poultry feed ingredient used to improve poultry production and increase its efficiency as result, needs to focus on better utilization of available feed resources because of poultry feed cost accounts 60-70% of the total poultry production cost [5]. However, the consumption of poultry product in Ethiopia remained low: 0.4 kg eggs and 0.6 kg of chicken meat per annum [6]. Poultry production in Ethiopia commonly used low-input and low output poultry husbandry systems.

Moreover, there have been increase in the number of exotic breeds of chickens and at present it is estimated that the exotic breeds of chicken represent about 6.45% of the national poultry population [7]. There has been a substantial effort to introduce exotic chicken especially Sasso T44 breed to the smallholder farmers under traditional management in Ethiopia

Sasso is a company names that leading French "Label Rouge" poultry producer which known original parent breeding stocks imported. The bird came from a long and strict selection based on the performance. It has come from the cross breeding of a Sasso rooster and a recessive Sasso hen. Sasso chicken breeding program is high production of hatching eggs from the parent breeder. Sasso T44 chickens are dual-purpose (meat and egg production) and originally developed to be reared under the low-input scavenging system of the smallholder farmers [8]. Sasso T44 chickens are slow growing, robust, easy to manage, multi-colored broiler which can be grown under different rearing systems from intensive to free range and village family based production. Sasso T44 chickens are improved tropically adapted breed, developed in France and tested in Ghana [9]. Due to slower growth rate, Sasso meat is more firm and has that rich chicken flavor, juicy and tasty like the meat of traditional Indian chicken and it commands higher market price. Sasso hens are newly introduced into the Nigerian tropical environment. It has been emphasized that the introduction of tropically adapted genotypes chickens. High performance is beneficial to the resource poor poultry farmers [10].

Sasso T44 breed has been introducing to the smallholder farmers under traditional management in North Shewa Zone, Amhara Region. However, there is no any documented study focusing on the health sanitation and health conditions of such breed. Hence, the objective of the study was to assess the sanitation and health conditions of Sasso T44 chicken under traditional production system in the study districts.

Materials And Methods

Description of the Study Area

The study was conducted in North Shewa Zone, Amhara National Regional State which is located 130 km of North east of Addis Ababa, altitude between 2800- 2845 m.a.s.l. and an annual temperature between 5°C to 23°C. North Shewa has three different agro -ecologies i.e. high land, mid land and low land. This study was conducted in Termaber district as a high land, Ankober district as mid land and Kewet district as low land.

Sampling Procedure

The study districts were selected based on agro-ecologies as highland (>2500m.a.s.l), mid-land (1500-2500 m.a.s.l) and lowland (<1500 m.a.s.l) which were the sampling frame [11]. Based on this information Tarmaber, Ankober and Kewet districts were selected as highland, mid land and lowland, respectively. Three rural kebeles from each agro-ecology (a total of 9 Kebeles) were purposively selected based on accessibility and chicken rearing experience. The number of respondent in each kebeles were taken as simple random sampling technique depend on chicken

raring potential and flock size at least four Sasso T44 chicken in each respondent. The total household heads in the study area was determined by the formula given by [12] with 95% confidence level;

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

Where n= Sample size, N= population size and e = the desired level of precision

Based on this formula, a total of 325 respondents were selected and interviewed using a structured questionnaire.

Method of Data Collection

The survey data were collected as primary and secondary data. Primary data was collected from household interviews, field observation, focus group discussion and key informant interviews. Secondary data was collected from district and zonal agriculture offices like, poultry population and way of chicken management system by reviewing different document.

Methods of Data Analysis

The data were analyzed by using Statistical Package for Social Sciences (SPSS version. 20). The statistical tools such as mean, frequency and percentage were used and present by Tables. Chi-square test was employed to determine the association of categorical data such as chicken management practices like feeding, watering, housing, and health condition.

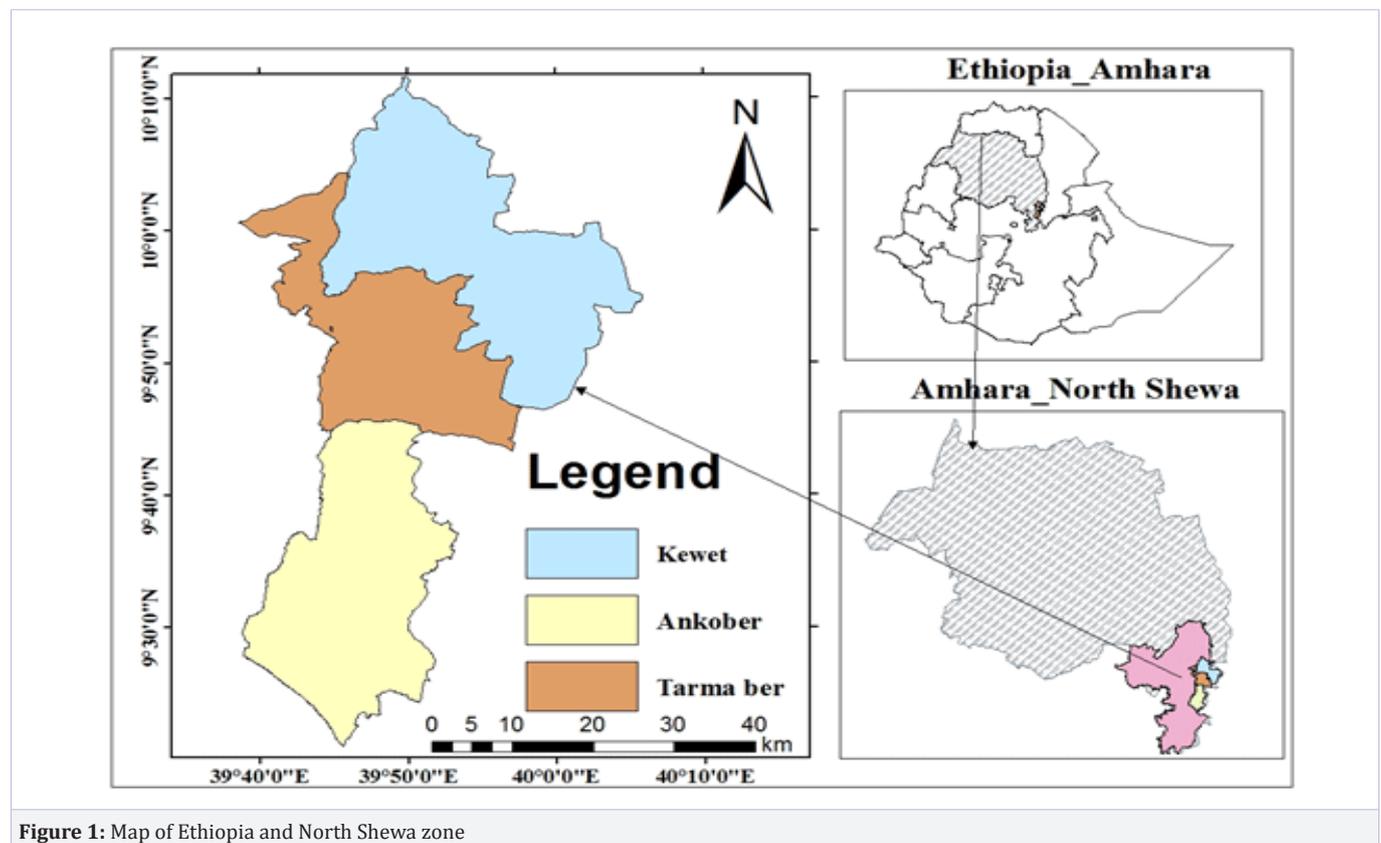


Figure 1: Map of Ethiopia and North Shewa zone

Results

Hygiene and Sanitation of Poultry House

In the survey about 55.4% of the respondents cleaned their chicken's house in different times such as daily (12.9%), weekly (26.8%) and monthly (15.7%). About 16.6% of the respondents disinfected the chicken house to prevent ecto parasites of chicken.

Chicken Health Condition

The most common (70.77%) prevalent disease in the three study districts was Newcastle disease (NDV) outbreak. For instance, in the study districts high chicken mortality (62.8%) and morbidity (37.2%) were occurred. As result, the farmer treated their chicken in different techniques. Most of them 30.77% treat by own, 17.85% call veterinary experts, 14.77% treat by own and call veterinary experts; otherwise 7.38% of the respondents replied that killed their chicken immediately in the three districts.

Table 1: Hygiene and sanitation of poultry house in the study districts

Parameter	Study Districts					
	Tarmaber	Ankober	Kewet	Total	χ ²	Test
	(H)	(M)	(L)			
N (%)	N (%)	N (%)	%		P-value	
Cleaning practice of chicken house						
Yes	72(55.4)	60(57.7)	48(52.7)	55.4	4.8	0.091
No	58(44.6)	44(42.3)	43(47.3)	44.6	2.91	0.233
Chicken house cleaning interval						
Daily	17(13.1)	12(11.5)	13(14.2)	12.9	1	0.607
Weekly	36(27.7)	28(26.9)	23(25.3)	26.8	2.966	0.227
Monthly	19(14.6)	20(19.3)	12(13.2)	15.7	1	0.607
Disinfecting the chicken house						
Yes	21(16.2)	18(17.3)	15(16.5)	16.6	1	0.607
No	109(83.8)	86(82.7)	76(83.5)	83.4	6.339	0.425

χ²=chi square; N =number of respondents; H= highland; M= midland; L=lowland

Table 2: Chicken disease prevention and treatment method in the study districts

Parameter	Study Districts					
	Tarmaber	Ankober	Kewet	Total	Test	
	(H)	(M)	(L)		χ ²	P-value
N (%)	N (%)	N (%)	%			
Chicken disease outbreak						
Chicken disease outbreak	89(68.5)	70(67.3)	71(78)	70.77	2.983	0.225
Most common type of chicken disease						
Newcastle disease	89(68.5)	70(67.3)	71(78)	70.77	2.983	0.225
Measures taken when chicken sick						
Treat by own	31(23.9)	32(30.8)	37(40.7)	30.77	0.62	0.733
Call vet doctor	26(20)	17(16.4)	15(16.5)	17.85	3.552	0.169
Kill them immediately	5(3.8)	8(7.7)	11(12)	7.38	2.25	0.325
Treat by own and call veterinarian	27(20.8)a	13(12.5)b	8(8.8)c	14.77	12.125	0.002
Method of dead chicken disposal						
Throwing away	81(62.3)	66(63.5)	69(75.8)	66.46	1.75	0.417
Burring	8(6.2)	4(3.8)	2(2.2)	4.31	4	0.135

Type of traditional medication						
Garlic+ lemon + feto	36(27.7)	24(23.1)	29(31.9)	27.38	2.449	0.294
Tetracycline + lemon + garlic	10(7.7)	3(2.9)	11(12.1)	7.39	4.75	0.093
Pepper + lemon +garlic	9(6.9)a	1(0.9)c	5(5.5)b	4.62	6.4	0.041
Zewodarem + endod leaf	3(2.3)b	17(16.4)a		6.15	9.8	0.002
Not common	72(55.4)	59(56.7)	46(50.5)	54.46	5.729	0.057
Practice of chicken vaccination	38(29.2)	27(26)	25(27.5)	27.69	3.267	0.195

χ^2 =chi square; N =number of respondents; H= highland; M= midland, L=lowland. Letter of different superscript in same row did differ significantly.

Discussion

There was no any statistical difference in hygiene and sanitation of poultry houses among the three agro ecologies (highland, mid land, and lowland). Majority of the respondents had lack of awareness in cleaning and disinfecting the chicken house regularly. As a result, Sasso T44 chicken was easily attacked by different disease and parasite which leads to irregular production and increase death rate in the study area. This study contradicted to the reports of [13], about 88% of the farms disinfect the poultry houses in smallholder farmers. According to livestock and veterinary experts' response, the most common prevalent disease in the three study districts was Newcastle disease (NDV) outbreak. However, there was no any significant difference in highland, midland and lowland areas in disease outbreak. The present study was in agreement with the finding of [14] who reported about 73.5% of the respondents reported that the most common exotic chicken disease was Newcastle disease. Most of the sick chickens were treated by own, call veterinary experts, treat by own and call veterinary experts in the three districts of North Shewa Zone. Most of the respondents treated their chicken by using traditional medicines like garlic+ lemon+ feto, Tetracycline + lemon + garlic, pepper + lemon+ garlic and Zewodarem + endod leaf. The respondents believed that such traditional medicines have a great role to cure sick birds rather than treated by antibiotics.

The dead birds in the study area were thrown away by most of the respondents in the three agro ecologies . However, [15] reported that the dead birds were buried under the ground in small-scale commercial poultry farms in and around Est Gojjam Zone. Similar finding was reported by [16] where 52% of dead birds were buried around the farm. [10] Reported that 56% of dead birds in and around Mekelle were removed via throwing. [17] Also reported that in small-scale intensive system of production about 55.6% of the producers disposed dead chicken via burying. However, burning/incineration process is expected to destroy all infective agents [18]. However, the three agro ecologies in the three districts (highland, midland and lowland) had not a significant impact in practicing of hygiene and sanitation of poultry houses, and in disease prevention and treatment methods except using of traditional medicines.

Conclusion

Sasso T44 chickens have good performance under traditional production system. However, the farmers had no awareness

for cleaning and disinfecting their chicken houses regularly, therefore, the chickens were attacked by different disease, especially Newcastle disease virus (NDV) outbreak the most common prevalent disease in the three studied districts. As a result, regularly cleaning of chicken house regularly and vaccination of chicken required. Hygienic disposal of dead birds at least by burying to protect household poultry and to prevent disease transmission.

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References

1. G T Gerima, Y Meseret, A A Teddy. Socio-economic characteristics of poultry production in lowland and midland agroecological zones of central Tigray, Ethiopia. *Afr. J. Poultry Farming.* 2016;4(6):149-158.
2. J R Lawal, A M Bello, S Y Balami, Y Wakil, Z B Yusuf and J Dauda et al. Prevalence and economic significance of ectoparasites infestation in village chickens (*Gallus gallus domesticus*) in Gombe, Northeastern Nigeria. *Direct Res. J. Agric. Food Sci.* 2016;4(5):94-103.
3. MoA (Ministry of Agriculture), Ethiopia livestock master plan: Roadmaps for growth and transformation. Addis Ababa: Ministry of Agriculture and Nairobi, Kenya:ILRI. 2015.
4. R Wilson. Poultry production and performance in the Federal Democratic Republic of Ethiopia. *J. Poult. Sci.* 2010;66.
5. Lesson S, J D Summer. *Commercial Poultry Nutrition*, 3rd Edition. 2005.
6. FAO (Food and Agriculture Organization). *Global Poultry Trends- The Poultry Site.* 2013;1-7.
7. CSA (Central Statistical Agency), (2018). *Agricultural Sample Survey. Report on livestock and livestock characteristics (Private peasant holdings). Volume II. Statistical Bulletin, 587.* Addis Abeba, Ethiopia. 100p.
8. A Yakubu, J. Madaki. Modelling growth of dual-purpose Sasso hens in the tropics using different algorithms. *J.Genet Mol Biol.* 2017;1(1):1-9.
9. O Richard, B Boniface, T Kayang, N Augustine. Age, genotype and sex effects on growth performance of local chickens kept under improved management in Ghana. *Trop Anim Health Prod.* 2012;44(1):29-34.
10. Yakubu, A. and M.M. Ari, 2018. Multivariate analysis of body weight and other traits of Sasso. kuroiler and indigenous Fulani chickens in

- Nigeria. *J. Anim. Plant Sci.* 28(1).
11. ADAO (Ankober District Agricultural Office), (2017). Ankober District Agricultural Office Annual Report, North Shewa Zone, Ethiopia.
 12. Yamane Taro. *Statistics an introductory analysis.* 2nd Edition. New York: Harper and Row. 1967
 13. H Birhanu, A Tehetna, H Yohannes, T. Awot. Assessment of Bio-Security Condition in Small-scale Poultry Production System in and Around Mekelle, Ethiopia. *European Journal of Biological Sciences.* 2015;7(3):99-102.
 14. N Mekonnen, F Begna, S Abraha. Husbandry Practices and Egg production Performances of Exotic Chicken Breeds in Assosa Town, Beneshangul Gumuze Region, Ethiopia. *Advance Research Journal of Multidisciplinary Discoveries.* 2017;18(14):72-80.
 15. Melkamu Bezabih Yitbarek. Management practices and constraints of small-scale commercial poultry farms, and performance evaluation of broilers fed diets containing graded levels of dried blood-rumen content mixture. 2017.
 16. Uduak Akpabio, Jacob KP Kwaga, Junaidu Kabir, Veronica J umoh, Olatu Jr Olatu. Assessment of Some Poultry Management Practices in Kaduna State, Nigeria. *World J Public Health Sciences.* 2014;3(1):1-4.
 17. Bereket Addis, Desalew Tadesse, Shigdaf Mekuriaw. Study On Major Causes Of Chicken Mortality And Associated Risk Factors in Bahir Dar Zuria District, Ethiopia. *African Journal of Agricultural research.* 2014;9(48):3465-3472.
 18. NABC (National Agricultural Biosecurity Centre). *Carcass Disposal: A Comprehensive Review.* Report written for the USDA Animal and Plant Health Inspection Service. Kansas State University, USA. 2004.