Global Journal of Science Frontier Research: D
Agriculture and Veterinary
Volume 18 Issue 8 Version 1.0 Year 2018
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Farmers' Breeding Practice & Traits of Economic Importance for Indigenous Chicken in Lume District, Oromiaregional State, Ethiopia

By Alemayehu Guteta & Misba Alewi

Abstract- The study aimed at farmers' breeding practice and traits of economic importance for indigenous chicken in lume district, Oromia regional state, Ethiopia. Random samplings were employed to select sample kebeles based on chicken population and purposively select respondents. Administrations of pretested questionnaire were employed on three kebeles of 90 respondents' scavenging chicken keepers, were interviewed. The kebele respondents' were categorized in to 1st, 2nd and 3rd strata having 1-10, 11-20 or 21-49 chicken, respectively. About 97.8 % of the respondents used their hens to incubate the eggs and brood the chicks. Type of container or material used for incubation was not significantly ($p<0.05$) different across the strata. From overall, (66.7%) of response used 'dogogo or dimignit' (made up soil). farmers practiced control and uncontrolled mating system not significant ($p<0.05$) different across the three strata. From the overall households uncontrolled mating (81.1%). majority of respondents in all three strata cull their bird for selling purpose (income) (83.3%). Majority of the household (33.3%) keep the chicken for production egg and meat production. The household use egg for income generation (57.8%), for home consumption (24.4%) and Most of the respondent consume or eat egg and chicken meat during the religion/cultural or holiday (64.4%), (93.3%), respectively.

Keywords: *breeding objective, culling; trait preference, village chicken, strata, lume district.*

GJSFR-D Classification: *FOR Code: 070201*

Strictly as per the compliance and regulations of:

Farmers' Breeding Practice & Traits of Economic Importance for Indigenous Chicken in Lume District, Oromiaregional State, Ethiopia

Alemayehu Guteta[α] & Misba Alewi[σ]

Abstract- The study aimed at farmers' breeding practice and traits of economic importance for indigenous chicken in lume district, Oromia regional state, Ethiopia. Random samplings were employed to select sample kebeles based on chicken population and purposively select respondents. Administrations of pretested questionnaire were employed on three kebeles of 90 respondents' scavenging chicken keepers, were interviewed. The kebele respondents' were categorized in to 1st, 2nd and 3rd strata having 1-10, 11-20 or 21-49 chicken, respectively. About 97.8 % of the respondents used their hens to incubate the eggs and brood the chicks. Type of container or material used for incubation was not significantly ($p<0.05$) different across the strata. From overall, (66.7%) of response used 'dogogo or dimignit' (made up soil). farmers practiced control and uncontrolled mating system not significant ($p<0.05$) different across the three strata. From the overall households uncontrolled mating (81.1%). majority of respondents in all three strata cull their bird for selling purpose (income) (83.3%). Majority of the household (33.3%) keep the chicken for production egg and meat production. The household use egg for income generation (57.8%), for home consumption (24.4%) and Most of the respondent consume or eat egg and chicken meat during the religion/cultural or holiday (64.4%), (93.3%), respectively. Majority the households rearing the chicken because of short generation 1st, 2nd and 3rd strata were (40%, 26.7% and 43.3%), respectively. From plumage color red color (56.6%) followed by white color (31.1%), Wosera (4.4%), Gabsima (3.3%), Kokima (1.1%) and not select any plumage color (4.4%). Regarding to the comb type the household revealed that (74.4%) were prefer double comb type, Farmers need encouragement to practice rotational mating to avoid closely related individual among their chicken flocks and home consumption to ensure protein source food by increasing number of chicken per households. Also future research has to focus farmer trait preference.

Keywords: breeding objective, culling; trait preference, village chicken, strata, lume district.

I. Introduction

The importance of rural poultry in national economies of developing countries and its role in improving the nutritional status and incomes of small farmers and landless communities has been recognized by various scholars and rural development agencies in the last two decades. Increased productivity of the poultry subsector by using exotic breeds in Ethiopia failed to become a sustainable option mainly because this strategy recurrently faced the problem of birds not being adopted widely by the rural farmers due to several socioeconomic and environmental challenges (Teklewold *et al*. 2006). The local chickens of Ethiopia are estimated about 60.5 million chickens in the country of which 94.3% are local chickens. In the country 2.79 percent and 1.35 percent of the total population were to be reported hybrid and exotic respectively indicating the significance of local chickens as potential Farm Animal Genetic Resources in the country.(CSA, 2015/2016).More than 95% of the Ethiopian poultry production system consists of local chickens which are traditionally considered to be disease resistant and adaptive to the prevailing harsh environmental conditions. Moreover, village chickens are well known to possess desirable characters/special features such as ideal mothers, good sitters, hatch their own eggs, thermo tolerant, excellent foragers and ability to utilize the limited and poor quality feed resources, immunities to resist common poultry diseases, the special meat and egg quality/flavor, hard eggshells, high fertility and hatchability as well as high dressing percentage. The local chickens are of great importance as the farmers may little or not add any inputs (concentrate feeds & incubators) like for raising exotic breeds (Aberra, 2000; Amsalu, 2003)

Recently a genetic improvement program has been initiated for increasing productivity of indigenous chickens of Ethiopia through selective breeding, as a means both to improve the livelihood of poor people as well as conserve the existing genetic diversity through utilization. Developing appropriate animal breeding programs for village conditions requires defining the production environments and identifying the breeding practices, production objectives, and trait choices of rural farmers (Solkner et al. 1998). The traits traditionally considered as criteria for selecting breeding stock are important in describing the adaptive attributes and genetic merits of the indigenous chickens and in identifying farmers' choice of chicken breeds and the underlying factors that determine the choice of genetic stock used. The market preferences for specific traits identified in the current study could be used to compliment or stimulate further work on economic valuation of the traits (Scarpa 1999). However, even in

Author α: DebreZeit Agricultural Research Center, P.O.Box 32, DebreZeit, Ethiopia. e-mail: alemayehuguteta@gmail.com

the absence of economic values, the results could be used to simulate alternative breeding schemes by using appropriate genetic parameters and deriving relative weights for the breeding objective traits using the desired-gain selection-index method as suggested by Solkner et al. (2008). A number of exotic and indigenous breeds were distributed and found in the district but little information is available on the objective breeding and trait preference. The objective is to study brooding, trait preference and breeding objective village chicken under scavenging production systems in Lume district.

II. Material and Methods

a) Description of study area

The study was conducted in Lume district, East Showa zone, Oromia regional state, Ethiopia. The district is located 70 kms South-East of Addis Abebaand cover 75,220.32 ha of land, which is lowland (Kolla) represent 25%, midland (Weynadega) 45% and highland (Dega) 30% of land coverage of district. The district total populations were 117,415. According to Lumedistrict 2015 report, the district cover 75,220.32 ha of land, the total cultivated land of the disrict is 43,713 ha, for livestock grazing 361.08 ha, for irrigation 6,497 ha, for forest 2,462.38 ha and unproductive land was 802.40 ha. Geography location ranging from 1500 to 2300 m.a.s.l and the annual rainfall range from 500-1200 mm and temperature 18 °C-28 °C.

b) Sampling method

The survey was carried out under scavenging poultry production system. Survey for scavenging poultry production was conducted by stratifying based on number of chicken in the household. Households having 1-10 chicken were first stratum, 11-20 chicken second stratum and 21-49 chicken was third stratum. Three *kebeles (Tulu Re'e, EjereWalkite and EjersaJoro*) were randomly selected for questionnaire administration and from each *Kebele* 10 households per strata were selected purposively, a total of 30 households per *Kebele* and 90 households per district was interviewed by pre-test questioner.

c) Statistical analysis

The qualitative and quantitative data were analyzed using appropriate statistical analysis software (SPSS, version 20). The Duncan multiple range test and LSD were used to locate treatment means that are significantly different. More specifically descriptive statistics and General Linear Model (GLM) were used for this study. Also mean, SD and percentage are statistics summarized. The estimations are made by using SPSS software program, version 20 (SPSS for Windows, 8) and SAS for indicating significance difference.

III. Results and Discussions

a) Household Characteristics

From household characteristics of interviewed village chicken owners it is found out that head 90% of the respondent households were male headed while remaining 10% of were female headed (Table 1). The proportion of male headed households (93.3%, 90% and 86.7%) were higher than female headed households (6.7%, 10% and 13.3%) in the 1st, 2nd and 3rd strata, respectively. The result was similar to reported from Western zone of Tigray, Northern Ethiopia (Shishay, 2014), North-West Amhara (Fisseha, 2009), in which proportions of males (80%, 86.3%, 85.1% and 74.4%) were higher than females (20%, 13.7% and 14.9% & 25.6%) headed households respectively. Regarding education level illiterate, capable of reading & writing, primary education and secondary education were 23.3%, 31.1%, 35.6% and 10%, respectively. The proportions of education status of the respondents were no variation across the strata. The proportions of illiterate (23.3%, 20% & 26.7%) in the 1st, 2nd and 3rd strata respectively. This indicates that the household have equally access to education services in the three of strata, but the highest populations of the respondent were educated primary education in each strata. Education status better than illiterate (41.5%, 41.3%,) reported from South-West Showa, Gurage zone of Ethiopia (Emebet, 2015) and Western zone of Tigray, Northern Ethiopia (Shishay, 2014), respectively. However it was less than reported from Dale, Wansho and Koka Abaya Weredas of SNNPRS (Mekonnen, 2007)

About (88%) of total respondent were orthodox Christian whereas remaining (1% and 1%) are protestant and Muslim in the study area respectively. The proportions of orthodox Christian followers were observed (96.7%, 100% and 96.7%) in the 1st, 2nd& 3rd strata chicken production respectively. The protestant followers were observed (3.3%) in 3rd stratum and Muslim followers were (3.3%), in 3rd stratum chicken production. Similar result have been reported from Western zone of Tigray, Northern Ethiopia (Shishay, 2014) that (93.5%) of total respondents were orthodox Christian followers while remaining (6.5%) of the were Muslim but contrasting, Meseret (2010) report that (86.1% and 12.8%) of the respondent were followers of Muslim and orthodox Christian, respectively in Gomma district of Jiimma zone. The result of survey revealed that majority of total respondent (80%) were married whereas the remaining (6% and 4%) of the respondent where divorced and window, respectively. The occurrences of married respondent under the current (88%) lowers than reported from Gomma District of Jimma zone by (Mesert, 2010) (97.2%) but higher than reported from Western zone of Tigray, Northern Ethiopia (Shishay, 2014) (82.1%) and fairly similar proportion

reported from Western Amhara administrative region by (Werku *et al*., 2012) (90.3%). Regardless of ethnic group in the study area of from total respondents' (74%) and (16%) were Oromo and Amhara, respectively. The proportion of respondents' Oromo ethnic group in the 1st, 2nd, 3rd strata chicken were (86.7%, 83.3% and 76.7%), respectively and the proportion of respondents' Amhara ethnic group 1st stratum (13.3%) 2nd stratum (16.7%) and 3rd stratum (23.3%) chicken production.

Table 1: Demographic characteristics of households (%)

Household characteristics	1st strata	2nd strata	3rd strata	Total	X^2-test	P-value
Sex of households head					0.741(ns)	0.690
Male	28(93.3)	27(90)	26(86.7)	81(90.0)		
Female	2(6.7)	3(10.0)	4(13.3)	9(10.0)		
Educational status					1000.913(*)	0.000
Illiterate	7(23.3)	6(20.0)	8 (26.7)	21(23.3)		
Read and write	10(33.3)	10(33.3)	8 (26.7)	28(31.1)		
Primary education	11(36.7)	11(36.7)	10 (36.)	32(35.6)		
Secondary education	2 (6.7)	3 (10)	4 (10.0)	9(10)		
Region of households					93.359(*)	0.000
Orthodox	29(96.7)	30(100)	29(96.7)	88(97.8)		
Protestant	-	-	1 (3.3)	1(1.1)		
Muslim	1(3.3)	-	-	1(1.1)		
Marital status of households					84.917(*)	0.000
Married	25(83.3)	28(93.3)	27 (90.0)	80(88.9)		
Divorced	3 (10.0)	1(3.3)	2 (6.7)	6(6.7)		
Widow	2 (6.7)	1 (3.3)	1 (3.3)	4(4.4)		
Ethnic group					59.678(*)	0.000
Oromo	26 (86.7)	25(83.3)	23(76.7)	74(82.2)		
Amhara	4(13.3)	5(16.7)	7(23.3)	16(17.8)		

*p<0.05) or significant at P (0.05), ns (p>0.05) or insignificant at P (0.05) and n=Number of households interviewed

b) Brooding and Incubation

Natural incubation is the most commonly used method for replacing and increasing the size of flocks. A hen often finds a dark and quite place in the house for laying eggs. After the eggs were collected, farmers adjust nest boxes for broody hens. In the traditional backyard poultry production system, by its nature hens are responsible for the new flocks. About (97.8 %) respondents used to incubate and brood their hen. This result was higher than Mekonin (2007) reported (89.4 %) of the respondents used to incubate and brood their hen during the dry seasons from Dale, Wonsho and Loka Abaya district of SNNPRS. From overall (96.7%) household did not mind the position egg when incubate, they used any position randomly and (3.3%) not incubate the egg, used for consumption. Type of container or material used for incubation was not significantly (p<0.05) different across the strata. From overall, (66.7%) of response used *'dogogo or dimig*nit' (made up soil), and followed by carton (21.1%), half of *'jarrycan'* (made up of plastic) (6.7%) '*setate*' (made up clay soil) (3.3%) and not yet incubate was (2.2%), they used for consumption and market. Mekonin (2007) reported that usually they use bamboo made baskets, cartoons and they also sit the hen simply on the ground (putting some bedding materials like worn clothes, grass) and in some cases use clay pot.

Farmers in the study area practiced different methods to break broodiness in hens. These includes tied to outside of house (29.9%), physically moving the bird to nearby house for a couple of days tied two legs together, put the feather in noise and disturbing from place (19.8%), tied two legs together and put in side house (12.3%) and disturbing the sitting nest-boxes (17.8%), tied two legs for 3 day(8.8%), put the feather in the noise (5.7%) and not do any (5.7%). Mekonin (2007) reported piercing the nostrils with a feather to prevent sitting (2.6%), physically moving the bird to nearby house for a couple of days (39.0%), by hanging the bird upside down for about 3-4 consecutive days (28.9%) and disturbing the sitting nest-boxes (29.6%). The purpose of such practices was to disturb the broody bird and to cause a hormonal shift so that it starts to lay eggs.

Table 2: Incubation of egg and brooding hen three strata

Variable	1st stratum	2nd stratum	3rd stratum	Total	X²-test	P-value
What method do you used for brooding and rearing chicken					2.022(ns)	0.364
Broody hen (natural methods)	29(96.7)	29(96.7)	30(100)	88(97.8)		
No	1(3.3)	1(3.3)	-	2(2.2)		
How do you set egg for incubation					4.023(*)	4.023
Any position randomly	29(96.7)	29(96.7)	30(100)	88(97.8)		
Not incubate yet	1(3.3)	1(3.3)	-	2(2.2)		
What type of container you used to incubating the eggs					8.886(ns)	0.352
'Dogogo' *(Dimignit)*	23(76.7)	20(63.4)	18(60)	60(66.7)		
Carton	4(13.3)	5(16.7)	10(33.1)	19(21.1)		
'Half of *Jarrycan*'	1(3.3)	4(13.3)	1(3.3)	6(6.7)		
'*Setate*' (made up of clay soil)	1(3.3)	1(3.3)	1(3.3)	3(3.3)		
Not incubate yet	1(3.3)	1(3.3)	-	2(2.2)		
What local practices used to avoid broodiness					25.786(ns)	0.105
Tied to outside of house	10(33.3)	6(20)	11(36.7)	27(29.9)		
Moving to neighbor, tied two legs together, put the feather in noise and disturbing from place	7(23.3)	5(16.7)	6(20)	18(19.8)		
Tied two legs together and put in side house	3(10)	6(20)	2(6.7)	11(12.3)		
Put the feather in the noise	-	3(10)	2(6.7)	5(5.7)		
Tied two legs for 3 day	2(6.7)	2(6.7)	4(13.3)	8(8.8)		
Disturbing from the place	6(20)	7(23.3)	3(10)	16(17.8)		
Not do any	2(6.7)	1(3.3)	2(6.7)	5(5.7)		

*(p<0.05) or significant at p (0.05), ns (p.>0.05) or insignificant at P(0.05)and n=number of households interviewed

c) Egg Production performance of village chicken

The survey revealed that average eggs/hen/clutch was no difference across strata. Total egg productions per hen per year were (76.4±29.4), number eggs wasted per set were in 1st stratum higher (3.5±1.2) than 2nd (2.6±1.3) and 3rdstrata (3.2±2.3). The average age of scavenging cockerels at first mating and pullets at first egg were (24.4±7.3)weeks and (24.2±4.0) weeks, respectively. The result were comparable with Fisseha *et al.,* (2010a) reported that the average age of local cockerels at first mating and pullets at first egg were 24.6 weeks (5.74 months) and 27.5 weeks (6.42 months), respectively from Bure district North-West Amhara. Also the results of survey were similarly, Halima (2007) reported that 77.4% of cocks of local chicken ecotypes in North-West Ethiopia reached maturity at 20-24 weeks of age. Mourad and Gbanamou (1997) also reported that the average age of village chicken pullets at first lying in Guinea was 25.7 weeks. Similar studies by various authors also indicated that sexual maturity age of female village birds were; 28 weeks in Tanzania (Katule, 1992), 24 weeks in Mali (Kassambara, 1989) and Nigeria (Sonaiya & Olori, 1998), 32 weeks in Sudan (Wilson, 1979), 28-36 weeks in Benin (Assan, 1990) and 25 weeks in Senegal (Sall, 1990).

Table 3: Production performance (Mean ± SD)

Variable	1st stratum	2nd stratum	3rdstratum
Average eggs /hen/ clutch	15.4± 3.8	15.8±4.2	16.3±3.5
*No. egg incubated/ set	11.8±2.4	12.7± 2.2	11.7±4.2
No. egg hatched/set	8.9±2.0	9.4±2.1	9.2±2.8
No. egg wasted/set	3.5±1.2	2.6±1.3	3.2±2.3
No. chicken weaned/ hatched	5.9±2.2	6.7±1.7	4.8±2.1
No. clutch per year	4.5±1.4	4.9±1.2	4.8±1.5
Total egg production /hen/year	67.3±4.6	83.4±33.9	78.1±27.3
Average age of cockerel at 1st mating (weeks)	23.2±7.1	25.2±4.3	24.9±9.9
Average age of pullets at 1st egg (weeks)	24.4±5.4	24.5±3.1	23.6±3.1

*No=number

d) Breeding and Culling Practice

The result of the study indicate that farmers practiced control and uncontrolled mating system not significant (p<0.05) different across the three strata. From the overall households uncontrolled mating (81.1%) and control mating system (18.9%). Likewise

uncontrolled mating practice of 1st, 2nd and 3rd strata (90%, 83.3% and 70%) and control mating system 1st, 2ndand 3rd strata (10%, 16.6% and 30%) of them practice because of scavenging production system. In the survey area, farmers have their own criteria and strategies way of control mating such as cull at early age male (30%, 43.3% and 46.7%) of 1st, 2ndand 3rd strata, respectively, culling poor productive (3.3%, 10% and 3.3%) of 1st, 2ndand 3rd strata, respectively and culling poor productive and cull at early (0%, 13.3% and 16.7%), of age male, respectively. Also there a farmer not does any things to control mating (66.7%, 33.3% and 33.3%) of 1st, 2nd and 3rd strata, respectively. Generally way control mating was significantly different ($p<0.05$) among the strata. The result was similar with Addisu *et al.,*(2013) revealed that (89.2%) of village chicken owners had uncontrolled natural mating system while (10.79%) of them had practice mate control of the flocks though their retaining best indigenous or exotic cock with layers (52.79%), preventing mate (24.37%), cull at early age (19.19%) or culling poor productive (3.55%). Moreover the result of the studies conducted by Nugusie (2010) in different part of Ethiopia revealed that village chicken breeding as completely uncontrolled and replacement stock produced though natural incubation using broody hens.

Furthermore, when observe scheme of breeding, the respondents who have been participated on chicken breeding practice, method of breeding and way of improving indigenous was significantly different across the three strata ($p<0.05$). Overall, respondents who have been practice chicken breeding were (50%) and not practice was (50%).Most of respondents use method of chicken breeding through improved indigenous (41.1%) followed by importing exotic (10%) and non-practice breeding methods (48.9%) and respondents use way of improving indigenous though cross breeding (8.9%), lines breeding (40%) and non-try to improve their indigenous chicken (51.1%).The analyses of character consider chicken for breeding, select broody hens for incubation and criteria for selection of broody hen wan not significantly different ($p<0.05$) among the three strata. The character consider chicken for breeding plumage color (23.3%), body weight (22.2%), egg production (27.8%), mothering ability (3.3%), comb type (4.4%), i do not see any criteria (18.9%).

According to survey culling and depopulating birds that are unproductive practice when produce the chicken. It reveals that majority of respondents in all three strata cull their bird for selling purpose (income) with an overall average of (83.3%) followed by culling for home consumption and income (12.2%), and for only home consumption (3.3%) while a small number of respondents not culling practice (1.1%). The result was fairly similar with Emebet (2015) reported cull their bird for selling purpose (income) with an overall average of (72.3%) in the study area followed by culling for home consumption and income (16.9%), and for only home consumption (9.1%) while a small number of respondents cull their birds to sacrifice for religious rituals. Nevertheless, greatest proportion of households used culled chickens for selling, slaughtering and selling in lowland (12.5% and 33.1%), respectively as compared both highland (10.6% and 30.9%) and midland (7.6% and 9.9%) which reported by Shishay (2014).

The survey revealed that determine factors of culling are old age (22.2%), poor production (1.1%), surplus male (7.8%), sickness behavior (7.8%) and before rainy season (6.7%) because of disease outbreak at rainy season, an able to feed, also climate difficult for chickens. Age of the chicken decided to cull was 7-12 months (41.1%), 13-48 months (52.2%) and > 49months (6.7%) ware stated from study area. Comparable result was reported by Emebet (2015) from poor productivity (31.8%), old age (26.7%), before rainy season (13.5%) and the outbreaks of disease (19.6%) and lack of capacity to manage large number of bird (8.4%) as major determining factors in culling and reducing the number of chickens.

Table 4: Breeding practice %

Variable	1st stratum	2nd stratum	3rd stratum	Total	X²-test	P-value
What type of mating system do you practice					6.642(ns)	0.156
Control mating	3(10)	5(16.6)	9(30)	17(18.9)		
uncontrolled mating	27(90)	25(83.3)	21(70)	73(81.1)		
Way control mating					12.433(*)	0.053
Culling poor productive	1(3.3)	3(10)	1(3.3)	5(5.6)		
Cull at early age male	9(30)	13(43.3)	14(46.7)	36(40)		
Culling poor productive and cull at early age male	-	4(13.3)	5(16.7)	9(10)		
Not do any	20(66.7)	10(33.3)	10(33.3)	40(44.4)		
Do you practice breeding					17.867(*)	0.000
Yes	6(20)	22(73.3)	17(56.7)	45(50)		
No	24(80)	8(26.7)	13(43.3)	45(50)		
Breeding method					22.028(*)	0.001

Improved indigenous	6(20)	18(60)	13(43.3)	37(41.1)		
Importing exotic	-	5(16.6)	4(13.3)	9(10)		
None	24(80)	7(23.3)	13(43.3)	44(48.9)		
Way of improving indigenous					18.438(*)	0.003
Cross breeding	1(3.3)	3(10)	4(13.3)	8(8.9)		
Lines breeding	5(16.7)	19(63.3)	12(40)	36(40)		
None	24(80)	8(26.7)	14(46.7)	46(51.1)		
What character you consider chicken for breeding					15.293(ns)	0.286
Plumage color	9(30)	5(16.7)	7(23.3)	21(23.3)		
Body weight	5(16.7)	10(33.4)	5(16.7)	20(22.2)		
Egg production	8(26.6)	7(23.3)	10(33.4)	25(27.9)		
Mothering ability	2(6.7)	1(3.3)	-	3(3.3)		
Comb type	-	3(10)	1(3.3)	4(4.4)		
I do not see any criteria	6(20)	4(13.3)	7(23.3)	17(18.9)		
Do you select broody hens for incubation					2.105(ns)	0.349
Yes	22(73.3)	24(80)	19(63.3)	65(72.2)		
No	8(26.7)	6(20)	11(36.7)	25(27.8)		
What is the major criteria for selection of broody hen					22.583(ns)	0.125
Big body size	3(10)	-	-	3(3.3)		
Which sit more time on the egg	-	1(3.3)	-	1(1.1)		
Good breed background	1(3.3)	-	-	1(1.1)		
Which quick broody	-	1(3.3)	-	1(1.1)		
Good experience	4(13.3)	7(23.3)	1(3.3)	12(13.3)		
Good protective, sit more time, lay more egg and good breed	7(23.3)	8(26.7)	6(20)	21(23.3)		
Good experience, big size, double comb and black hen	7(23.3)	7(2637)	13(43.3)	27(30)		
Color of the chicken (*Wosera*)	1(3.3)	-	-	1(1.1)		
None	7(23.3)	6(20)	10(33.3)	23(25.6)		

*(p<0.05) or significant at p (0.05), ns (p.>0.05) or insignificant at P(0.05)and n=number of households interviewed

Table 5: Calling practices, culling purpose determine factors and age of culling (%)

Variable	1st stratum	2nd stratum	3rd stratum	Total	X^2-test	P-value
How/Purpose culling chicken					11.047(ns)	0.087
Slaughter	1(3.3)	2(6.7)	-	3(3.3)		
Sell	25(83.3)	27(90)	23(76.7)	75(83.4)		
Slaughter and sell	4(13.3)	-	7(23.3)	11(12.2)		
None	-	1(3.3)	-	1(1.1)		
Determinant factor for culling					9.332(ns)	0.156
Old age	3(10)	7(23.3)	10(33.3)	20(22.2)		
Poor production	-	-	1(3.3)	1(1.1)		
Surplus male	21(70)	20(66.7)	15(50)	56(62.2)		
Sickness	6(20)	1(3.3)	-	7(7.8)		
Before rainy season	-	2(6.7)	4(13.3)	6(6.7)		
What age of the chicken decided to cull					31.969(ns)	0.276
7-12 months	11(36.7	18(60)	8(26.7)	37(41.1)		
13-48 months	16(53.3)	10(33.3)	21(70)	47(52.2)		
> 49 months	3(10)	2(6.7)	1(3.3)	6(6.7)		

*(p<0.05) or significant at p(0.05), ns (p.>0.05) or insignificant at P(0.05)and n=number of households interviewed

e) Objective Chicken Production, Consume and Trait Preference

The survey revealed that the aim of keeping or rearing bird and the use of egg not significantly different (p<0.05) among the three strata of the study area. Majority of the household (33.3%) keep the chicken for production (meat, eggs and dual) purpose followed by to incubate and hatch the eggs (21.1%), home consumption (18.9%), to scarify guest (15.6%), income generation(7.8%) and to celebrate ceremony (3.3%) in the study area. Likewise, the household use egg for income generation (57.8%), for home consumption (24.4%), to be incubated and hatch for sustainable production (16.7%) and to scarify/ entertain guest (1.1%). Most of the respondent consume or eat during the religion/cultural or holiday (64.4%), every time when available (32.2%) and when family members being sick (3.3%). Also chicken meat the household consume/eat

mostly during the religion/cultural or holiday (93.3%) followed by every time (when the available) (5.6%) and totally not consume/eat (1.1%) in the study area. Shishay (2014) also reported that in highland agro-ecology farmers mainly reared chicken primarily for sale and for income (1st), ceremony (2nd), home consumption (3rd) and while in the midland agro-ecology chicken reared for ceremony (1st), home consumption and ceremony (2nd) and sell for income (3rd). Fisseha *et al*., (2010) revealed that sales for income (51%), hatching (breeding) (45%), and home consumption (44%), ceremony (36.4%) and egg production (40.7%) were rearing purposes of chicken.

The advantage and disadvantage of keeping the chicken in the study area were significantly different ($p<0.05$) across the three strata. Majority the households rearing the chicken because of short generation 1st, 2nd and 3rd strata were (40%, 26.7% and43.3%), respectively, because of easily manageable1st, 2ndand 3rd strata were (10%, 16.7% and 20%), respectively, because required little capital in the 1st, 2nd and 3rd strata were (6.7%, 20% and 16.7%), respectively. Likewise the disadvantage of keeping the chicken the survey states that the chicken easily get disease in the 1st , 2nd and 3rdstrata were (63.3%,70% and 73.3%), respectively, followed by the chicken not resist too cold and too hot climate in the 1st, 2nd and 3rdstratawere (33.3%,6.7% and 16.7%) respectively. When the season changed the mortality of chicken was high that related to the chicken cannot tolerate the fluctuation of season in the study area. The survey revealed that the preference of color of chicken, and preference of comb type were not significant difference ($p<0.05$) at study area. This confirms that farmers across strata have nearly used homogeneous attribute in selecting best breeding chickens from their flock for achieving their production objectives. From plumage color red color (56.6%) followed by white color (31.1%), Wosera (4.4%), Gabsima (3.3%), Kokima (1.1%) and not select any plumage color (4.4%). Shishay (2014) reported that Red, Gebsima and Anbesimacolored chicken in that order most preferred to chicken with other plumage colored chicken are the last favored for breeding and consumption. Regarding to the comb type the household revealed that (74.4%) were prefer double comb type and followed by not select the comb type respondent was (24.4%) and prefer single comb was (1.1%). The respondent state that reason prefer double comb that good price when sell (48.9%), cultural belief (8.9%), good body weight (8.9%), personal interest (8.9%), comb type effect (22.2%) in the study area.

Table 6: Objective of chicken production (%)

Variable	1st stratum	2nd stratum	3rd stratum	Total	X^2-tes	P-value
Why do you keep or rear bird					19.290(ns)	0.154
Income generation	3(10)	1(3.3)	7(10)	7(7.8)		
Home consumption	4(13.3)	7(23.3)	6(20)	17(18.9)		
For production purpose	15(50)	10(33.3)	5(16.7)	30(33.3)		
To incubate and hatch egg	3(10)	6(20)	10(33.3)	19(21.1)		
To scarify guest	4(13.3)	4(13.3)	6(20)	14(15.6)		
To celebrate ceremony	1(3.3)	2(6.7)	-	3(3.3)		
What purpose do you use egg					4.124(ns)	0.660
Income generation	19(63.3)	16(53.3)	17(56.7)	52(57.8)		
Home consumption	6(20)	10(33.3)	6(20)	22(24.4)		
To be incubate and hatch	5(16.7)	4(13.3)	6(20)	15(16.7)		
To scarify guest	-	-	1(3.3)	1(1.1)		
When do you consume or eat egg mostly					6.724(ns)	0.347
Every time (when available)	9(30)	9(30)	11(36.7)	29(32.2)		
During religion/cultural/holiday	20(67.7)	21(70)	17(56.7)	58(64.4)		
When being sick	1(3.3)	-	2(6.7)	3(3.3)		
When do you consume or eat chicken mostly					3.671(ns)	0.452
Every time (when available)	1(3.3)	1(3.3)	3(10)	5(5.6)		
During religion/cultural/holidays	29(96.7)	28(93.3)	28(93.3)	84(93.3)		
Not consume chicken	-	1(3.3)	-	1(1.1)		
What is advantage of chicken rearing or keeping					26.667(*)	0.021
Little capital	2(6.7)	6(20)	5(16.7)	13(14.4)		
Need less feed	1(3.3)	-	-	1(1.1)		
Little Land required	-	5(16.7)	1(3.3)	6(6.7)		
Short generation	12(40)	8(26.7)	13(43.3)	33(36.7)		
Not need keepers	7(23.3)	4(13.3)	-	11(12.2)		
Can easily slaughter and sale	4(13.3)	-	5(16.7)	9(10)		
Easily manageable	3(10)	5(16.7)	6(20)	14(15.6)		
They scavenging(feed is not	1(3.3)	2(6.7)	-	3(3.3)		

mandatory						
What is disadvantage of chicken rearing or keeping					24.651(*)	0.017
Easily get disease	19(63.3)	21(70)	22(73.3)	62(68.9)		
Grain, crops and destroyed	-	2(6.7)	3(10)	5(5.6)		
Not recover from any disease (died)	-	2(6.7)	-	2(2.2)		
Expose to predator	-	3(10)	-	3(3.3)		
Feed compute with human	1(3.3)	-	-	1(1.1)		
Not resist too cold and too hot climate	10(33.3)	2(6.7)	5(16.7)	17(18.9)		
*(p<0.05) or significant at p (0.05), ns (p.>0.05) or insignificant at P(0.05)and n=number of households interviewed						

Table 7: Preference traits (%)

Variable	1st stratum	2nd stratum	3rd stratum	Total	Xtest	P-value
Which color do you prefer more					9.949(ns)	0.634
White	7(23.3)	11(36.7)	10(33.3)	28(31)		
Red	16(53.3)	15(50)	19(63.3)	50(56)		
'Gabsimma'(grayish mixture)	2(6.7)	1(3.3)	-	3(3.3)		
'Kokima'(black,brown&white)	1(3.3)	-	-	1(1.1)		
'Wosera' (back and white)	2(6.7)	2(6.7)	-	4(4.3)		
Not select any color	2(6.7)	1(3.3)	1(3.3)	4(4.3)		
What is the comb type of your birds					6.209(ns)	0.400
Single (*Netela*)	1(3.3)	-	-	1(1.1)		
Double (*Dimdim*)	24(80)	21(70)	22(73.3)	67(74.4)		
Both (single and double)	5(16.7)	9(30)	8(26.7)	22(24.4)		
Why you prefer double comb					37.873(*)	0.036
Cultural beliefs	2(6.7)	3(10)	3(10)	8(8.9)		
Good body weight	6(20)	1(3.3)	1(3.3)	8(8.9)		
They are protective from any like predator	1(3.3)	-	-	1(1.1)		
Comb type no effect	4(13.3)	9(30)	7(23.3)	20(22.2)		
Good breeding	1(3.3)	-	-	1(1.1)		
Good price on market	13(43.4)	15(50)	16(53.3)	44(48.9)		
Personal interest	3(10)	2(6.7)	3(10)	8(8.9)		
*(p<0.05) or significant at p(0.05), ns (p.>0.05) or insignificant at P(0.05)and n=number of households interviewed						

IV. Conclusion and Recommendation

The productivity of scavenging chicken can be enhanced by relatively simple changes in management techniques like training farmer and developmental agentand improve breeding practice. That households have mix of chicken genotypes which creates favorable condition for unplanned crossbreeding among the variable genotypes. Also because of the fact that most of the time scavenging chicken mix with neighbouring flock, the aggressive cock are likely to dominate and interbreeding to happen, and lead to inbreeding. Farmers need encouragement to avoid closely related individual among their chicken flocks through keeping breeding cock and exchange them with other farmers located further than that scavenging distance. Farmers used traditional system container for incubation, break broadness and select broody hen for incubation, this if supported by advanced way that play role in increase production and productive of chicken. Chicken producer have more interest to red color and double comb chicken trait because market oriented. Local ecotype chicken have low production and broodiness character not easily break so, farmers need togeteither improved indigenes chicken or pure exotic chicken which reproduce themselves careful consideration genetic dilution. The future research have to focus trait preference of farmer, that satisfy needs in terms cultural/regional& market oriented and it lead farmer encourage to chicken production.

Acknowledgment

This piece of work is funded by the International Livestock Research Institute (ILRI), LIVIS. Project to which we are grateful. I thank also all interviewed village chicken owners, and other participants who helped us to carry out every activity of this work.

References Références Referencias

1. AberraMelesse. 2000. Comparative studies on performance and physiological responses of Ethiopian indigenous (*"Angete-melata")* chicken and their F1 crosses to long term heat stress. Ph.D Thesis. Martin-Luther University, Halle-Wittenberg, Halle, Germany.
2. Addisu, H. 2012. Phenotypic Characterization of Indigenous Chicken Ecotypes in North Wollo, Amhara Regional State, Ethiopia. M.Sc. Thesis

submitted to the school of graduate of Bahirdar University, Bahirdar, Ethiopia.
3. Amsalu, A. 2003. Practical poultry training manual (Unpublished). Amhara region agricultural research institute, kombolchapoultry research and multiplication center.
4. Assan, B.E. 1990. Lelevage villageois de la volaille en Republique du Benin: Situationactuelle. CTA Seminar, proc. on smallholder rural poultry production, Thessaloniki, Greece, 2:17-26.
5. Central Statistics Authority.20015/16. Agricultural sample survey 2015-2016. Report on livestock and livestock characteristics, Vol. II. Statistical Bulletin No. 446. Addis Ababa, Ethiopia.
6. EmebetMoredae. (2015). Phenotypic and genetic characterization of indigenous chicken in southwest showa and gurage zones of Ethiopia, PhD Thesis, Addis Abeba University, Ethiopia
7. FessehaMoges. 2009. Studies on production and marketing system of local chicken ecotypes in BureWoreda, North-West Amhara, M.Sc Thesis. Hawassa University, Hawassa,
8. Fisseha Moges, Abera Melese and Tadelle Dassie.(2010a). Assessment of village chicken production system and evaluation of the productive and reproductive performance of local chicken ecotype in Bure district, North West Ethiopia. African J.Agri.Res. 5(13):1739-1748.
9. Halima Hassen. 2007. Phenotypic and genetic characterization of indigenous chicken populations in North-West Ethiopia. Ph.D. Thesis. Submitted to the faculty of natural and agricultural sciences department of animal, wildlife and grassland Sciences. University of the Free State, Bloemfontein, South Africa. Hawassa University, Ethiopia.
10. Kassambara, A.I. 1989. La production avicole au Mali: problems et perspectives. In: Proceeding of International workshop on rural poultry in Africa, 13-16 November 1989, Ile-Ife, Nigeria. pp: 140-150.
11. Katule, A.M. 1992. Study on the potential value of indigenous chickens in Tanzania. Rural Poultry Development Newsletter. 2:4.
12. MeseretMolla. 2010. Characterization of village chicken production and marketing system in Gommaworeda, Jimma zone, Ethiopia. M.Sc Thesis. Jimma University, Ethiopia.
13. Mekonnen G/Egizaber. (2007). Characterization of smallholder poultry production and marketing system of Dale, wonsho and lokaabayaworedas of southern Ethiopia. MSc. Thesis presented to the School of Graduate Studies of Hawassa University.
14. Moges Fisseha. Abera Melese and Tadelle Dassie. (2010a). Assessment of village chicken production system and evaluation of the productive and reproductive performance of local chicken ecotype in Bure district, North West Ethiopia. African J.Agri.Res.,5(13):1739-1748.
15. Mourad, M. B. A. S. and G. Gbanamou. 1997. Evaluation de la productivité et de la mortalité de la poule locale sur le plateau de Sankaran, Faranah, Guinée, en 1993-1994. Révue d'élevage et de Médécine Vétérinaire des Pays Tropicaux 50: 343-349.
16. Nigussie Dana, AlemuYami, TadelleDassie and Samuel Wagari. 2003. On-station and on-farm evaluation of the 'hay-Box chick brooder' using different insulation materials at DebreZeit Agricultural Research Center and Denbi village, Adaaworeda. In: *Proceedings of the10th annual conference of the Ethiopian Society of Animal Production,* August 21–23, held in Addis Ababa, Ethiopia. pp. 211–216.
17. Sall, B. 1990. Contribution a l'etude des possibilites d'amelioration de la production en aviculture traditionnelle: mesure du potentiel de la race locale etdes produits d'un croisement ameliorateur. M.Sc. Thesis.
18. Scarpa, R., 1999. Revealed preference valuation methods for farm animal genetic material: principles, strengths and weaknesses. In: J.E.O. Rege (ed), Proceedings of an FAO/ILRI Workshop on economic valuation of animal genetic resources, Rome, 1999,(International Livestock Research Institute, Nairobi), 40-47
19. ShishayMarkos. (2014). Phenotypic characterization of local chicken ecotypes in Western zone of Tigray, Northern Ethiopia, MSc Thesis, Jimma university, Ethiopia.
20. Sonaiya, E.B. and V.E.Olori. 1998. Village chicken production in South-Western Nigeria. In: Proceeding of an International workshop on rural poultry development in Africa, 13-16 November, 1989, Ile-Ife, Nigeria. pp: 243-247.
21. Solkner, J., Nakimbugwe, H. and Zarate, A.V., 1998. Analysis of determinants of success and failure of village breeding programmes, 6th 4 World Congress on Genetics Applied to Livestock Production, 25, 273-280.
22. Solkner, J., Grausgruber, H., Okeyo, A.M., Ruckenbauer, P., and Wurzinger, M., 2008. Breeding objectives and relative importance of traits in plant and animal breeding: a comparative review, Euphytica, 161, 273-282.
23. SPSS. (2002). SPSS User's guide version 20. SPSS Institute Inc., Cary NC.
24. Teklewold, H., Dadi, L., Yami, A., and Dana, N., 2006. Determinants of adoption of poultry technology: a double hurdle approach, Livestock Research for Rural Development, 18(3).
25. Wilson, R.T. 1979. Production of poultry in Darfur, Sudan, under simulated traditional conditions tropical Animal Health and Production journal 11: 143-150.

26. Worku, Z., Melesse, A. & T/Giorgis, T. 2012. Assessment of Village chicken production system and the performance of local chicken population in West Amhara Region of Ethiopia. *Journal of Animal Production Advances*, 2 (4):199-207.