



Review on Management System and Production Constraints of Indigenous Chicken Ecotypes in Ethiopia

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ABSTRACT

The review was conducted to management system and production Constraints of indigenous chicken ecotypes in Ethiopia. Scavenging production systems is the dominant management practices of chicken with small feed supplementation. High incidence of chicken diseases, mainly Newcastle Disease NCD is the major and economically important constraints for village chicken production systems followed by predator and feeds. The production system is still extensive and low in performances are the major character of indigenous chicken genetic resources. Indigenous chickens are largely dominated flock size and have good potential to adapt different agro-ecologies through low management systems. High incidence of chicken diseases, mainly NCD is the major economically important. Constraints for village chicken production systems followed by feed shortage and predators in the country. Since local chickens have good potential to adapt in different agro-ecology and make available well-appointed source of family protein and income for rural people. Indigenous breeds of chickens are playing an important role for the rural poor people with respect to their subsidiary income and provide them with nutritious of chicken egg and meat for their own consumption. The present review were made to managemental system and production Constraints of indigenous chicken ecotypes in Ethiopia for rural economy and its improvement with respect to performance.

Keywords: Flock composition; Husbandry practice; Indigenous

INTRODUCTION

Characteristics of local chickens

Phenotypic characterization of Animal Genetic Resources for food and agriculture (AnGR) is the practice of systematically documenting the observed characteristics, geographical distribution, production environments and uses of these resources. The information provided by characterization studies is essential for planning the management of AnGR at local, national, regional and global levels [1].

The most important characteristic of local chickens are their potential both produce meat and eggs (dual-purpose). Most local chickens in rural areas have good maternal qualities, high survival rate and are hardier than exotic breeds but they grow slowly, they have the potential to grow fast if farmers select chickens with such characteristic for breeding. Pointed out that

variation in their growth and productivity is from gene possession [2].

The farmers with little or no income can also keep local chickens because they feed by scavenging from the surrounding. The method of producing local chickens is still primitive and suffers setback due to poor housing, poor feeds and feeding systems, disease outbreaks and predators [3].

Productivity of local chickens and flock size

The productivity of local chickens is low in case of unimproved breed, low quality of feed, water, housing and different predators. Generally, low husbandry (management) practice of owners in the country and high flock size. According to the reported that local chickens grow slowly and reach sexual maturity late and this influences production performance. The annual egg production of local chicken types in Ethiopia has been summarized in Table 1 below.

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Regarding the production potential of indigenous birds, studies carried out in western zone of Tigray indicated that the average annual egg production of the indigenous chicken was 52.68. A study carried out in Chagni town in Awi administrative Zone of Amhara and North Wollo zone of Amhara, respectively, revealed that the average egg production of local birds were 18.57 eggs, 43.8 eggs, 27.45 eggs and 49.51 eggs [4].

The overall number of eggs/hen per clutch of local hen reported in North Wollo Zone, North Gondar Amhara region and Ethiopia national average were 12.64, 11.53 (8-15) and 12 respectively, reported the average flock size of 9.2 and 9.18 chickens per household in central zone of Tigray and in south Wollo [5].

S.No.	Location	Chicken Type	Agro-ecology			Overall
			Low-land	Mid-land	High-land	
1	Western zone of Tigray	Local	48.98	54.2	54.87	52.68
2	Eastern zone of Tigray	Local	54.8	51.6	54.8	53.4
3	Northern Wollo	Local	47.99	48.32	52.3	49.536
4	Central Tigray	Local	44.3	42.7	-	43.5
5	Southern Tigray	Local	48.71	44.73	49.83	47.753

Table1: Annual egg production of local chicken types in Ethiopia.

Flock structure is described in terms of the number and proportion of the different age groups and sex in a flock. The mean values of chickens in different age category and proportion of the researchers identify (owning) different size of chickens are reported in Table 2 below.

According to Mearg, F.E.A.R.G., reported that the average flock size of chickens per household was 9.20 but highest mean number of hen per household was (35.43%) followed by chicks, (32.78%), pullet (15.56%), cockerel (8.69%) and cock (7.53%), respectively. The overall average flock size per household of respondent farmers in East Gojam zone was 13 chickens for local chicken and less than 5 for crossbreed chickens. And the average flock size of chickens per household in central zone of Tigray was 5.6.

Area (zone)	Cocks	Cockerel	Pullets	Chicks	Laying hens
Central Tigray	0.7	1	1.3	3.6	2.3

Mezhenger	1.99	0.33	0.8	3.71	5.95
Sheka and Bench-maji					
Central Oromia	0.5	0.4	0.9	1.1	3.1
Central zone of Tigray	0.71	0.87	1.55	3.27	3.54
South Wollo	0.99	1.38	1.58	3.27	1.96
Metekel	1.64	1.64	2.72	5.12	2.54
Awi zone	0.51	0.92	1.27	4.11	3.15

Table2: Flock Size composition of local chicken.

Management practices of chickens

Feeding practice: The major feeds and feeding practices of local chicken in Ethiopia is almost scavenging systems. Feeding chicken according to their age and production status is still uncommon practice in Ethiopia. A study conducted in Halaba district southern Ethiopia by revealed that 81.8% of farmers fed their chicken in whole flocks. Only chicks have been managed in separate group for few weeks unless other chicken categories scavenge freely around the back yard without any restriction [6].

According to 83.6% of the respondents were feeding their chicken flock in-group and the rest 16.4% of the respondents fed separately to the different age classes of chickens. One of the major production constraints to the development and growth of the rural family poultry in most developing countries is the estimation of feed intake and feed utilization under scavenging conditions [7].

A one study that conducted in Halaba district southern Ethiopia by revealed that 81.8% of farmers fed their chicken in whole flocks. Only chicks have been managed in separate group for few weeks unless other chicken categories scavenge freely around the back yard without any restriction. 83.6% of the respondents were feeding their chicken flock in group and the rest 16.4% of the respondents fed separately to the different age classes of chickens. The majority of the farmers who practiced supplementary feeding systems (mostly once per day) used maize, barley, wheat, finger millet and household waste products to feed their chickens. After hatching, the chicks were allowed to forage and roam freely with their mothers in open areas near the home and surroundings [8].

Housing

Good housing is a precondition for any sustainable poultry production. In rural areas, housing occupies a low priority in managing poultry including chickens under free-range. Housing systems in backyard is rudimentary and mostly built with locally available materials. Reported that 63%, of farmers kept their

chickens outside the main house, which is exclusively made for chickens in North Western Ethiopia [9].

Reported that only 48% of the respondents constructed separate houses for their birds; the other 52% kept in various overnight sheltering places. Chicken house is made of locally available material with minimal costs. For instance a study conducted in Metekel Zone, northwestern Ethiopia, showed that houses/night shelters were made using locally available materials such as bamboo for making ceilings (86.7%), mud blocks and hat (11.1%), a house made of iron sheet roof (1.5%) and basket made of bamboo (0.7%) [10].

Diseases and predators

Diseases and Predators are the most common in Ethiopia, According to report of Newcastle Disease (NCD) (locally called as “Wotetie”), and Reported that Newcastle Disease (NCD) (locally called as “fengile”) was the most prevalent and economically important disease affecting village chicken production in North Wollo. In addition, of NCD, cannibalism (locally called “melalat”) was observed as a constraint in mid altitude and low altitude areas at dry and sun-drenched season [11].

Reported that absence of disease control in many rural areas contribute to high mortality among local chickens. Vaccination with standard vaccines is not common in rural areas because many chicken farmers do not have income to buy such vaccines.

In Ethiopia, predation is considered as another economically important constraint in village chicken production system. The predation is strongly associated with the rainy season. The predators include primarily birds of prey such as vultures, which prey only on chicken and wild mammals such as cats, and foxes. Reported that 38.33% of the respondents was indicated that wild Egyptian Vulture (locally called ‘chilfit’) is a dangerous predator and attack on young chicks is higher. In addition, Mutmut/Arage (28.33%) was also reported the other important predator [12].

Marketing

The marketing practice and methods of transportation are traditional according to Mearg, F.E.A.R.G., reported that in the central zone of Tigray most of the village chicken owners (81%) participated in chicken and egg marketing. Reported that 99.7% of the respondents had participated in selling of chicken products. Higher proportions of households sold chicken products to their neighbors in the same village (98.8%) in lowland than in midland (67.9%). Greatest proportions of respondents in western zone of Tigray sold their chicken products in either district market (9.6%) or both the same village and district market (90.4%) in highland as compared to both midland (3.1% and 28.2%) and lowland (3.3% and 1.2%).

Reported that the prices of live chickens were determined by body weight (41.83%), combination of comb type and plumage color (32.4%) and plumage color (25.8%) in North Wollo zone of Ethiopia. Likewise, most of the respondents were the opinion that the eggs (90%) and meat (92%) obtained from exotic breeds

have poorer taste. This have confirmed by the lower market preference for eggs from exotic chickens.

Sexual maturity, clutch size and incubation practice

Natural incubation is the most commonly used method for replacing and increasing the size of flocks. age at first mating for cockerel in western zone of Tigray was 5.71 month and reported the age at first egg laying of local chickens in North Wollo zone of Amhara region was 6.6 months. also (7.02 months) of average age at first egg laying in the Nole Kabba wereda of Western Wollega which is an expression of low productivity of local chickens. Indigenous chickens are ideal mothers, good sitters, hatching their own eggs, excellent foragers and vigor. They are aggressive, hardy and possess some degree of natural immunity against some diseases. These factors are important ideal requirements for replication and sustaining their generation in scavenging nature. The most important characteristic of indigenous chicken is their broodiness (maternal instinct), which is pronounced for indigenous chickens in Ethiopia.

Broody hens were the only means of egg incubation and brooding young chicks. It is identified that, the average hatchability percentage of local hens in western zone of Tigray was 74.3%. The average hatchability of eggs of indigenous chickens under scavenging management condition was 81% in Nole Kabba wereda of Western Wollega.

Similarly, higher hatchability percentage were reported by who reported that the average egg hatchability of local chickens in West Amhara region of Ethiopia, Metekel Zone of North West Ethiopia, North Gondar Amhara regional state and Halaba wereda of southern Ethiopia were 79.1%, 84.74%, 87.29% and 83.72% respectively, also reported that in western zone of Tigray the survival rate of chicken to weaning age were 73.06 with chick mortality rates ranging from 27% to 29.2% under extensive system.

Reported the mean annual egg yield per hen of indigenous chickens in Chagni town in Awi administrative Zone Amhara and North Wollo zone of Amhara were 27.45 eggs and 49.51 eggs (Table 3).

No	Age at 1st service for cockerel (month)	Age at 1st egg laying of hen (month)	Number of clutch per year of local chicken	Number of egg per clutch of local chicken	Total eggs per year of local chicken
1	5.29	5.96	4.58	15.2	69.6
2	4.97	5.83	3.85	14.36	54.51
3	5.44	5.2	4.29	13.56	59.51
4	5.795	5.73	4.14	14.47	56.61
5	6.06	6.49	3.62	12.64	49.51
6	5.87	5.86	3.45	12.81	53.18

7	5.21	5.77	4.29	14.44	61.82
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Table 3: Management of Some Reproductive traits of indigenous chicken in Ethiopia.

CONCLUSION

In Ethiopia, the agricultural sector is a corner stone of the economic and social life of the people since they are used for generation of extra cash incomes, provision of animal protein and religious/cultural considerations. Understanding the situation of poultry rearing was crucial for improvement of poultry products and to design poultry breeding strategy. Generally, chicken rearing system in Ethiopia was mixed with crop-livestock production system using traditional management of indigenous chickens. The presences of various predators and diseases prevalence were two major economic important of chicken rearing constraints.

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