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Perception of farmers on exotic chicken breeds and its management condition in North western zone Tigray, Ethiopia

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ABSTRACT

The study was conducted in two Woredas of North western zone of Tigray, Ethiopia. The survey was conducted by interviewing 264 randomly selected respondents to assess the chicken production system and perception of farmers regarding the benefits and constraints of using exotic chicken breeds. Of total, 95.1% of respondents practiced free ranging type chicken production system with little feed supplementation. About 95.4% of the respondents were using traditional treatment for their chicken as prevention as well as for treating their poultry from different diseases. Farmers' in the study area were perceiving that producing of exotic poultry have the benefits such as higher egg production capacity, fast growing ability of chicken and higher selling price of exotic poultry eggs as compared to the local ones. On the other hand, cost of the exotic chicken breed, needs more care, higher feed requirement, susceptibility to diseases and predators are among the major constraints in producing exotic poultry breeds as compared to local poultry. The government and non-governmental organizations that involved in improving poultry production in the rural areas should address the major constraints of poultry production that hinder the adoption of exotic poultry in the study area. Therefore, technical and institutional interventions are very crucial to reduce the existing constraints and improve the existing traditional chicken production system in the study area.

Keywords: exotic chicken breed, chicken management, perception, constraints

1. INTRODUCTION

FAO (2010) reported that poultry meat represents about 33% of the total global meat production, but in Ethiopia chicken meat contributes only about 4% of the total national meat production (LMP, 2015).

Different studies show that similarly to other African countries, village level poultry production contributes to various livelihood outcomes in Ethiopia, including gender equality, income generating, as well as its role in cultural, religious and traditional practices (Tadelle *et al.*, 2003b; Bush, 2006; FAO, 2009). In Ethiopia poultry are widespread and almost every rural family owns chicken (Tadelle *et al.*, 2003a). The chicken population in Ethiopia is estimated to be about 56.87 million (CSA, 2015). About 97.82% of the poultry production in Ethiopia is traditionally managed (FAO, 2009). In the rural areas of Ethiopia, most of the farmers have no separate house for their chickens and the chickens live together with the human population within one house. In line to this, the farmers have no planned feeding of their chickens and scavenging is almost the only source of feed and they have no planned breeding (Solomon, 2007; Mengesha *et al.*, 2011).

Local chicken takes the higher percent in the country (95.86%) as well as in the study area of north western Tigray (95.6%) in terms of population (CSA, 2015). However, the output (egg and meat) is low, have small body size, low hatchability at about 70%, high mortality estimated at about 40-60% of chicks die during their first eight weeks of age mainly due to disease and predators as compared to exotic chicken (Solomon, 2008).

To improve the poultry production, several exotic chicken breeds have been disseminated to the farmers over the last 50 years in the country (Solomon, 2008) and in the study areas the chicken was distributed for the last 15 years (Tselemti and Tahtay Koraro Office of Agriculture and Rural Development, 2016). But the adoption of these exotic chicken breed in most parts of the country is not promising due to its hindrance by a set of factors including sub-optimal management, lack of supplementary feed, low genetic potential and high mortality rate due to diseases and predators (Tadelle *et al.*, 2003b; Tekelewold *et al.*, 2006). In the study area there is no any documented study focusing to the chicken management and the perception of farmers on exotic chicken breed. Hence, the objective of this study was to assess chicken management condition and to assess the perception of farmers on the benefits and constraints of producing exotic chicken breed in the study Woredas.

2. MATERIALS AND METHODS

2. 1. Description of the study area

Tigray regional state is located in the Northern part of Ethiopia. North Western zone of Tigray is one of the six zones in Tigray region which is located 304 km west of Mekelle and 1087 km from Addis Ababa. The capital city of the zone is called Shire Endaslassie.

The study was conducted in the major exotic poultry producer Woredas of Tselemti and Tahtay Koraro of North western zone Tigray. From each of the two Woreda three Kebelles were used for the survey.

The study area of Tselemti Woreda has mid altitudes of 1,300 meters above sea level, with average annual minimum temperature of 15.8 °C, average annual maximum temperature

of 35.6 °C while the annual rainfall ranges from 758 to 1100 mm. In the study area livestock and crop farming is common. Cattle, goat, chicken and bee colonies are the dominant livestock of the Woreda. The major crops of the Woreda are sorghum, maize, finger millet and sesame (Tselemti Office of Agriculture and Rural Development, 2016).

Similarly Tahtay Koraro Woreda has a mean annual rainfall of 750 mm, mean annual temperature of 27 °C and with a mid altitude of 1953 meters above sea level. The Woreda is known for its mixed farming, crop and livestock in which the crop subsystem dominates over livestock. The crop production system is both rain fed and irrigated. The major crop of the Woreda includes *teff*, maize, field pea and chickpea; and the horticultural crops like banana, mango and vegetables like hot pepper, tomato and garlic are doing also grow in the Woreda. The dominant livestock of the Woreda are cattle, goat, sheep and chicken (Tahtay Koraro Office of Agriculture and Rural Development, 2016).

2. 2. Research methodology

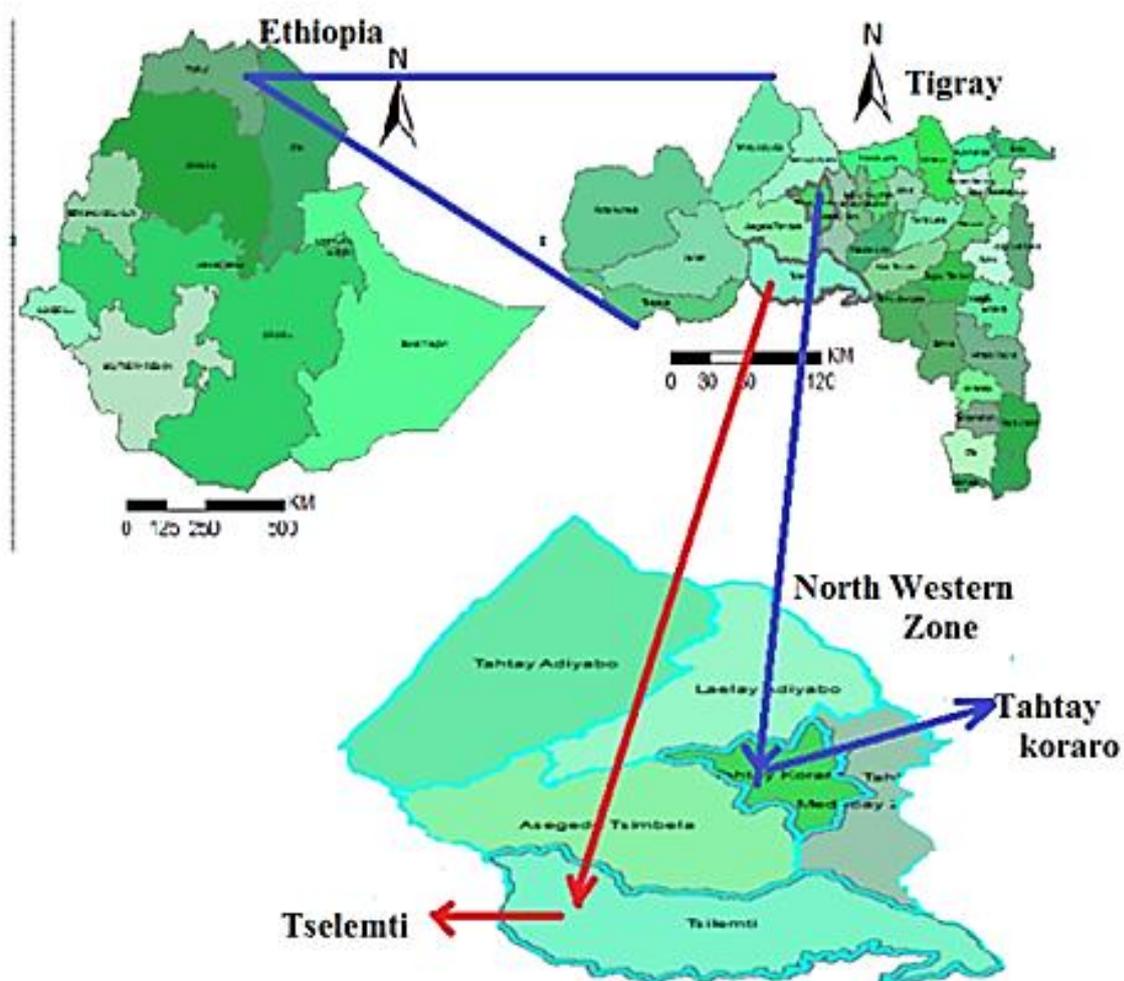


Figure 1. Map of the study area

In this study, multi stage sampling procedure was employed in selecting the respondent households. First two Woredas (Tselemti and Tahtay Koraro) were selected purposively based on their production potential of exotic poultry. Secondly, exotic chicken producer Kebelles was identified. Then, among the identified Kebelles, three Kebelles from each of the selected Woredas were selected using simple random sampling method. Finally, a total of 264 farm households samples (132 per each Woreda), which are the producers of poultry were selected randomly using systematic random sampling.

The study was conducted from October-December 2016. Data was collected sample respondents through interviewing using semi-structured questionnaire and the data was analyzed using descriptive statistics using Statistical Package for Social Sciences.

3. RESULTS AND DISCUSSION

3. 1. Perceptions of farmers on the benefits and constraints of rearing exotic chicken breed as compared with local chicken

Identifying the benefits and constraints of rearing exotic poultry breed as compared with local poultry using farmers' point of view is an important way for explaining why farmers prefer or do not preferred exotic poultry breed. Farmers do vary in their perception regarding the benefits and constraints of rearing exotic poultry as compared to local one. In this study farmers were asked to respond to the characteristics on the benefits and constraints of using exotic poultry as compared to local breed.

Accordingly, Likert scale with the scales of inferior, same and superior was employed to assess the benefit attributes of using exotic poultry breeds over the local one or vice-versa. Using the Likert scale different characteristics such as egg production capacity, egg market price, poultry market price and chicken fast growth were used to construct the Likert scale questions and assess the benefits of rearing exotic poultry breed over local poultry or vice-versa.

As the result indicates 87.5, 71.4, and 80.3% of respondents in Tselemti Woreda, and 83.3, 77.8 and 87% of respondents in Tahtay Koraro Woreda, respectively, were mentioned as exotic poultry breeds are superior of over the local one in the attributes of egg production capacity, market price of egg and chicken fast growth (Table 1). However, exotic poultry breed has low market price as compared to the local poultry. In line to this the sample farmers were also responded that exotic poultry breeds are less preferred in the market as compared to local ones. For instance, the preference of exotic cock poultry in the market is very low as compared to the cock of the local breed. According to the respondents observation the main benefits of rearing exotic poultry breed is ranked as 1st, 2nd and 3rd for the egg production capacity, egg market price and chicken fast growth (Table 1).

The sample farmers were also identified the most important constraints that hinder the dissemination and adoption of exotic poultry breed. The main constraints that limit the adoption of exotic poultry were suggested by the respondents as susceptibility to diseases, susceptibility to predators, lack of vaccination access, higher feed requirement, needs more care, expensiveness of the breeding stock and market problem. Thus, severe, same and less severe Likert scales were used to compare the level of constraints in rearing of exotic poultry breed with the local one.

Table 1. Perception of farmers on the benefits of using exotic chicken as compared with the local one and the prioritized benefits of rearing exotic chicken.

No	Attributes	Benefits of using exotic poultry breed versus local breed			Priorized benefits of rearing exotic poultry			
			Woreda		Woreda			
			Tselemti (n = 132)	Tahtay Koraro (n = 132)	Tselemti (n = 132)		Tahtay Koraro (n = 132)	
			%	%	%	Rank	%	Rank
1	Egg production capacity	Superior	87.5	83.3	92.8	1 st	88.9	1 st
		Same	8.9	11.1				
		Inferior	0	3.7				
2	Chicken fast growing	Superior	80.3	87	75	3 rd	77.7	3 rd
		Same	12.5	7.4				
		Inferior	3.6	3.7				
3	Egg market price	Superior	71.4	77.8	78.6	2 nd	81.5	2 nd
		Same	19.6	14.8				
		Inferior	5.4	5.5				
4	Poultry market price	Superior	21.4	46.3	48.2	4 th	57.4	4 th
		Same	32.1	22.2				
		Inferior	42.9	29.6				

Source: Survey output (2016), % = percentage of observations, n = interviewed households

The respondents (89.3%) and (80.3%) in Tselemti Woreda and (87%) and (72.2%) in Tahtay Koraro Woreda were, respectively emphasized that diseases and predators were the most constraints for the adoption of exotic poultry breeds. Similar to this study, Aman *et al.* (2015) also reported that diseases and predators were the most constraints of the chicken production in the Southern Ethiopia. In line to this expansiveness of the cost of the breeding stock (chick), needs more care and higher feed requirement of the breed were mentioned as the main constraints that seriously hinder for the successive dissemination and production of exotic poultry breed as compared with the local one in both of the study Woredas (Table 2).

According to the respondents perceptions, constraints of producing exotic chicken breed ranked depending on their level of seriousness as 1st, 2nd, 3rd, 4th, 5th, 6th and 7th for the susceptibility to diseases, cost of the breed (chick), susceptibility to predators, lack of vaccination access, higher feed requirement, market problem and needs more care, respectively, in Tselemti Woreda.

Whereas, in Woreda Tahtay Koraro the constraints of susceptibility to diseases, susceptibility to predators, cost of the breed (chick), lack of vaccination access, higher feed requirement, market problem and needs more care were ranked, respectively as 1st, 2nd, 3rd, 4th, 5th, 6th and 7th on their seriousness (Table 2).

Table 2. Perception of farmers on the constraints of rearing exotic poultry as compared to local breed and the prioritized constraints of rearing exotic poultry

No	Characterstics	Constraints of rearing exotic poultry breed compared to local			Rank of the constraints in rearing exotic poultry			
			Woredas		Woredas			
			Tselemti (n = 132)	Tahtay Koraro (n = 132)	Tselemti (n = 132)		Tahtay Koraro (n = 132)	
			%	%	%	Rank	%	Rank
1	Expensiveness the breeding stock (chicks)	Severe	78.6	75.9	87.5	2 nd	75.9	3 rd
		Same	12.5	20.4				
		Less	5.3	0				
2	Suceptible to predators	Severe	80.3	72.2	80.3	3 rd	79.6	2 nd
		Same	12.5	22.2				
		Less	3.6	3.7				
3	Suceptible to diseases	Severe	89.3	87	89.3	1 st	85.2	1 st
		Same	7.1	11.1				
		Less	0	0				
4	Needs more care	Severe	76.8	83.3	46.4	7 th	40.7	7 th
		Same	19.6	14.8				
		Less	0	0				

5	Higher feed requirement	Severe	78.6	87	67.8	5 th	68.5	5 th
		Same	17.8	11.1				
		Less	0	0				
6	Lack of vaccination	Severe	75	72.2	71.4	4 th	72.2	4 th
		Same	21.4	25.9				
		Less	0	0				
7	Market problem	Severe	37.5	35.2	55.3	6 th	59.2	6 th
		Same	53.6	48.1				
		Less	5.3	14.8				

Source: Survey output, 2016, % = percentage of observation, n = interviewed households

3. 2. Chicken management practices

As the result of this study indicates farmers in the study area are rearing chicken with low management aspects. Chicken management in the study area is associated with mothers and children's and mostly controlling and utilizing the income earned from the sale of eggs and chicken is left for mothers.

3. 2. 1. Feeding and watering

Most of the respondents in the study area feed their poultry in a scavenging with little supplementation systems (95.1%), while the rest (4.9%) respondents just let their poultry scavenge without supplementation. Similar to this the study, the study of Halima *et al.* (2007) in north-west of Ethiopia revealed that the greater part of the feed for village chicken is obtained through scavenging. The majority of the respondents in the study area were used grain (sorghum and maize) and food leftover as feed to supplement their chicken. Farmers were supplementing their poultry three times a day (59.1%) and the remaining supplements once a day as well as twice a day all age groups of poultry altogether.

The result also shows that most of the respondents (93.6%) provides water for their poultry in the trough by making it easily accessed to water the chicken during the whole day while the rest water their poultry at morning and evening times (Table 3). From the total respondents, 17.4% farmers did not have separate watering trough for their poultry; rather they give them in equipments that are commonly used to water other animals.

3. 2. 2. Chicken Housing

Housing is essential to poultry as it protects them from predators, theft, rough weather (rain, sun, cold and wind) as well as it provides shelter for egg laying and broody hen. Of the total sample respondents, majority (57.2%) constructed a separate house for their poultry; the remaining (38.25%) respondents only prepared shelter for night enclosure within their living room and 4.55% of the respondent let their poultry just perch at a tree logs at the around of

their homes. Lack of knowledge, lack of construction materials, fear of predators, risk of theft and shortage of labor were the reasons for not preparing a separate poultry house as mentioned by the respondents (Table 3). If farmers did not construct a proper house for their poultry, this can hinder the adoption of exotic poultry breeds, because it could expose the poultry to different diseases and predators.

Table 3. Housing, feeding and watering of chicken in the study Woredas

Parameters	Study Woredas		
	Tselemti (n = 132)	Tahtay Koraro (n = 132)	Overall (n = 264)
Feeding system (%)			
Scavenging with supplement	98.5	91.7	95.1
Only scavenging	1.5	8.3	4.9
Supplementation frequency (%)			
Once a day	14.4	22.7	18.6
Twice a day	15.2	19.7	17.4
Thrice a day	68.9	49.2	59.1
Providing water (%)			
Yes	100	100	100
No	0	0	0
Watering frequency (%)			
Morning	2.3	1.5	1.9
Morning and evening	3.8	5.3	4.5
Free access the whole day	93.9	93.2	93.6
Having separate watering trough for poultry (%)			
Yes	84.8	80.3	82.6
No	15.2	19.7	17.4
Housing system Have a different shelter for night enclosure in the same room	31.8	44.7	38.25

Separate house constructed entirely for chicken	62.9	51.5	57.2
Perch at the side of the house	5.3	3.8	4.55
Limitation to have a separate house (%)	21.97	29.55	25.76
Lack of knowledge	6.81	9.11	7.96
Fear of predators	2.26	5.3	3.78
Shortage of material	2.27	3.03	2.65
Risk of theft	3.79	1.51	2.65
Shortage of labor			

Source: Own survey result, 2016, % = percentage of observation, n = interviewed households

3. 2. 3. Health care for poultry

As reported by 93.9% of the respondents there is lack of accessibility of veterinary service in the study area. This poor coverage of veterinary services in the study area could negatively affect adoption of exotic poultry production. Even though there is lack of veterinary service in the study area different types of traditional treatments are used by farmers. The commonly used traditional treatment methods mentioned by the sample farmers were; 'nim' (*Melia azedarach*) (10.61%), lemon (6.06%), tetracycline (11.36%), garlic (1.89%), pepper (6.06%), pepper + lemon + garlic (13.64%), lemon + garlic + tetracycline (42.04%) and Moringa leaf (3.79%) (Table 4). These traditional treatments were applied through adding the medicinal additives during watering their poultry.

The result revealed that most of the farmers are using their indigenous knowledge while using the different plants and tetracycline purchase from veterinary drug shops while treating and preventing their poultry from different diseases regardless of the appropriate doses. These traditional treatments are used as prevention and treatment methods of the wide range poultry diseases. This study is consistent with the study of Sambo *et al.* (2014) which have reported that farmers were use traditional medicine to control poultry diseases in Ethiopia.

Table 41. Chicken diseases prevention and treatment methods used by farmers in the study areas

Parameters	Study Woredas		
	Tselemti (n = 132)	Tahtay Koraro (n = 132)	Overall (n = 264)
Have vaccination access to chicken (%)			
Yes	0.8	11.4	6.1
No	99.2	88.6	93.9

Using traditional treatment for chicken (%)			
Yes	96.97	93.94	95.45
No	3.03	6.06	4.54
Types of local treatment used to treat chicken (%)			
'nim'(Melia azedarach)	7.57	13.64	10.61
Tetracycline	9.1	13.64	11.36
Lemon	3.78	8.33	6.06
Garlic	0	3.78	1.89
Pepper	6.82	5.3	6.06
Pepper+lemon+ garlic	15.9	11.36	13.64
Lemon+garlic+tetracycline	48.5	35.61	42.04
Moringa leaf	5.3	2.27	3.79

Source: Own survey result, 2016, % = percentage of observation, n = interviewed households

4. CONCLUSIONS AND RECOMMENDATIONS

The main benefits of producing exotic poultry over the local breeds includes higher egg production capacity, fast growing ability of chicken and higher selling price of the egg as compared to the local ones. However, cost of exotic chicken breed, needs more care, higher feed requirement, susceptibility to diseases and predators were some of the major constraints related to producing exotic poultry breeds as compared with producing local poultry.

As the result of this study indicates farmers in the study area are rearing chicken with low management aspects such as low health care services, poor feeding and watering practices for the chicken. The government and non-governmental organizations that involved in improving the poultry production in the rural areas should address the major constraints of production that hinder the adoption of exotic poultry breeds in the study area. Hence, extension awareness on the benefits of using exotic poultry breeds, on management condition of the chicken and on improved method of poultry farming in rural areas of the study area should be conducted. As women are taking the vital role in managing and producing of rural poultry, the institutional support should target them before any other group.

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