

Assessment of marketing systems, customer preference and health management of chickens in free range and intensive poultry production systems in Minjar Shenkora District, Amhara Regional State, Ethiopia

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Abstract

A cross sectional study was conducted from November 2016 to April 2017 in Minjar Shenkora district, Amhara region, to assess marketing, customer preference and health management of chickens kept in intensive and in free production systems. Eight out of twenty nine Kebeles were purposively selected based on their poultry production potential and level of intensification. Data was collected from randomly selected 250 poultry producers by interview using structured and semi-structured questionnaire survey, group focused discussion and observation. The production systems were, intensive (36%) and free range (64%), and 66.6% of the producers were rearing chickens for income generation. Chickens in the present study were, cross breed (48.4%), and local breed (51.6%). This study indicated that, 93.6% of the poultry producers complained that, Newcastle Castle Disease (24%), Fowl pox (40%), Gumboro (20%), Coccidiosis (8) and others (8%) as the major poultry diseases in the study area. It was revealed that, 94.4% of the poultry producers have lack of market for their products due to fasting periods and customers preference. Age, sex, color, breed and other traits of the chickens were identified as the major customers' selection criteria. Therefore, designing disease control strategies, creating market linkage and rearing of chickens with desirable traits is very important to develop the poultry sector and improve the livelihood of the poultry producers in the study district.

Keywords: Chickens; Customer preference; Free range; Intensive; Marketing; Minjar Shenkora district

Introduction

Livestock production, as one component of agriculture, covers 40% of agricultural output and it also plays an important role in the national economy as it contributes 13-16% of the total GDP. Poultry production, as one segment of livestock production has a peculiar privilege to contribute to the sector. This is mainly due to their small size and fast reproduction compared to most other livestock and its well fitness with the concept of small-scale agricultural development. Moreover, it goes eco-friendly and competes for scarce land resources (Seifu, 2000).

Ethiopia has large population of chickens estimated to be 56, 866,719 of which, 54,510,523 (95.86%) 1,586,144 (2.79%) and 770,052 (1.35 %) were reported to be indigenous, hybrid and exotic chicken breeds, respectively (CSA, 2015). Despite the high number, their contribution to farm households and national income is still very low (2-3%) and the annual growth rates in egg and meat output were estimated to be 1% and 2.5% as compared to the Sub Saharan African countries, 5.7 and 6.8%, respectively (Negussie, 1999).

This is mainly due to different constraints including low productivity levels, poor management systems, diseases, low input of veterinary services, the quality and cost of feed, poor growth rate, poor housing conditions which expose birds for different diseases and predation, poor biosecurity, lack of information on the performance and organized market (Moges *et al.*, 2010; Mazengia, 2012). Moreover, poultry production in Ethiopia is characterized by small flock, minimal input and unorganized marketing system (Solomon, 2007).

In Minjar Shenkora district, the number of poultry producers is increasing from time to time. Despite a study on marketing systems, customer preference and health management of chickens is paramount important to identify the existing constraints and intervene accordingly, there is a gap in the study area. Therefore, this study was conducted with the objectives of marketing systems, customers preference, and major prevalent diseases of chickens and its management in the study area.

Materials and methods

Description of the study area

The current study was conducted in Minjar Shenkora district. Minjar Shenkora district is located at the Southern part of North Shewa Zone, Amhara Region. It is located at about 135 Km South East of Addis Ababa and has a total area of about 229, 463 Hectare. The geographical location of the study area is extended from 8°42'46" N to 9°7'37" N latitude and from 39°12'57" E to 39°46'53" E longitude. The altitude of the study district ranges from 1400-2400 m.a.s.l. The area obtains high rainfall between June to August and low rain fall between March to May, and dry season extends from September to February. The live-stock population of the district is 93,682 cattle, 39,157 sheep, 54,408 goats, 31,010 equines, 4,294 camels and 136, 338 poultry. Teff (*Eragrostis tef*), Wheat (*Triticum*), Sorghum (*Sorghum bicolor*), and Maize (*Zea mays*) are among the cereal crops grown in the area (MSWARDO, 2008).

Study design and sampling technique

A cross-sectional study was conducted from November 2016 to April 2017, to study marketing, customers' preference and health management of chickens kept in intensive and free range poultry production systems in Minjar Shenkora district. First, a purposive sampling technique was used to select eight Kebeles out of the total 29 Kebeles of the study districts. The Kebeles were selected based on their poultry production potential and level of intensity. The sample size was determined as described previously (Yamane, 1967).

$n = N / (1 + Ne^2)$, Where, n = the sample size; N = the size of population; e = the error of 5 percentage points. The total population of registered smallholder poultry producers in the study district was 6,66. So, according to the above formula the calculated sample size was 250 poultry producers.

Data collection

Primary data was collected from randomly selected 250 poultry producers by interview using structured and semi-structured questionnaire survey, group focused discussion and personal observation.

Data analysis

The collected raw data was entered into an Excel sheet, cleaned, coded, imported and analyzed using a Statistical Package for Social Sciences (SPSS) version 20. Then, descriptive analysis such as frequency and percentages were calculated for the qualitative data. Moreover, a Chi-Square test was conducted to test the association of respondents level of education with measures taken for sick chickens, dead chickens way of disposal and respondents slaughtering habit of sick chickens. Moreover, the association between respondents farming experience and dead chicken way of disposal was computed. A p-value <0.05 was considered statistically significant association.

Results

Respondents biography and socioeconomic characteristics

This study revealed that 75.6% and 24.5% of the respondents were males and females, respectively. Moreover, 59.2% of them were within age range of 18-30 years, and 50.8% of them were in their elementary level of education. Furthermore, 90.4% of the poultry producers had a farming experience of one to five years (Table 1).

Table 1. Respondents' demographic information and socioeconomic characteristics

Variables	Categories	Frequency	Percent (%)
Sex of respondents	Male	189	75.6
	Female	61	24.4
Level of education	Illiterate	37	14.8
	Elementary	127	50.8
	High school	80	32.0
	College and above	6	2.4
Age of respondents	18-30 years	148	59.2
	31-40 years	99	39.6
	>40 years	3	1.2
Farm ownership	Private	218	87.2
	Cooperative	32	12.8
Farming experience in years	1 - 5 years	226	90.4
	6 - 10 years	24	9.6
Motivation to rear chickens	For income generation	174	69.6
	For home consumption	40	16.0
	Both	36	14.4

Flock characteristics

The number of chickens kept by the poultry producers varies from household to household based on factors, such as farm size, degree of intensification, financial strength and market availability. The breed of chickens in the current study were cross breed (Bovans Brown) and local breeds (Table 2).

Table 2. Flock characteristics of chickens in Minjar Shenkora district

Variables	Categories	Frequency	Percent (%)
Farming system	Intensive	90	36.0
	Free range	160	64.0
Number of chickens per household	15-50 chickens	135	54.0
	51-100 chickens	68	27.0
	101-200 chickens	39	15.6
	>200 chickens	8	3.2
Breed of chickens	Local	100	40.0
	Cross	32	12.8
	Both	118	47.2

Marketing of chickens and customers' preference

Majority of the poultry producers in the current study (68.8%) sell their chickens and chicken products at the local markets. It was also revealed that, 94.4% of the poultry producers complained that they have lack of market especially during the fasting periods of the year. Moreover, 98.4% of the poultry producers' responded customers have preference for chickens and chicken products. Age, sex, color and breed of the chickens are among the selection parameters used by the customers (Table 3).

Table 3. Marketing of chickens and customers' preference

Variables	Categories	Frequency	Percent (%)
Where do you sell your products?	At local markets	172	68.8
	At urban markets	23	9.2
	At a farm level	55	22.0
Do you have market problem for your products?	Yes	234	94.4
	No	14	5.6
If yes, which of the following affect your product prices?	Supply and demand	4	1.6
	Product quality	3	1.2
	Season of the year	45	18.0
	More than one factor	184	73.6
If you say season, in which season do you get good price?	During fasting	1	0.4
	During holly days	235	94.0
	Others	1	0.4
Do customers have preference for chickens?	Yes	246	98.4
	No	4	1.6
If yes, preference depends on what?	Breed	46	18.4
	Age	3	1.2
	Coat color	1	0.4
	more one trait	196	78.4
If you say breed, which type?	Local	126	50.4
	Exotic	116	46.4
If you say age, which age category?	Chicks	2	0.8
	Growers	5	2.0
	Pullets	149	59.6
	Finishers	25	10.0
If you say hair coat color, which type?	Red	168	67.2
	White	14	5.6

Diseases and their management

Newcastle disease, fowl pox, Gumboro and coccidiosis were among the major diseases of chickens in the study area, and the poultry producers take different measures when their chicken got sick (Table 4).

Table 4. Diseases and diseases management of chickens in the study district.

Variables	Categories	Frequency	Percent (%)
Do you have Health problem for your chickens?	Yes	234	93.6
	No	16	6.4
Major poultry diseases	New Castle Disease	60	24
	Gumboro	50	20
	Fowl Pox	100	40
	Coccidiosis	20	8
	Others	20	8
Measures take to sick chickens	Take to veterinary clinic	132	52.8
	Treat using traditional treatment	35	14.0
	Slaughter for consumption	15	6.0
	Do nothing	39	15.6
Do you slaughter sick chickens for consumption?	Yes	53	21.2
	No	197	78.8
How do you dispose dead chickens?	By burning	44	17.6
	By burying	115	46.0
	Simply throw away	91	36.4

Association of some parameters

This study revealed that, the respondents farming experience was significantly associated with dead chickens way of disposal ($p < 0.05$) (Table 5). Moreover, the respondents level of education was found to have a statistically significant association ($p < 0.05$) with the measures taken when chickens got sick, dead chickens way of disposal and habit of the producers to slaughter sick chickens (Table 6).

Table 5. Association of respondents' farming experience with dead chicken way of disposal

Variables	Categories	Way of dead chicken disposal			X ²	p-value
		Burning	Burying	Throwing		
Farming experience	1 – 5 year	44(100%)	105(91.3%)	77(84.6%)	8.290	0.016
	6– 10 years	0(0.0%)	10(8.7%)	14(15.4%)		

Table 6. Association of respondents' level of education with measures taken for sick chickens, slaughter of sick chickens and dead chickens way of disposal

Variables	Category	Respondents level of education				X ²	p-value
		Illiterate	Elementary	High school	College and above		
Measures taken for sick chickens	Sell	2 (15.4%)	7 (53.8%)	4 (30.8%)	0(0.0%)	43.85	0.000
	Consulting veterinarians	8 (6.1%)	63 (47.7%)	57 (43.2%)	0(0.0%)		
	Treat traditionally	11 (31.4%)	20 (57.1%)	4 (11.4%)	0(0.0%)		
	Slaughter	3 (20%)	9 (60%)	3 (20%)	0(0.0%)		
	Do nothing	12 (20.8%)	19 (48%)	8 (20.5%)	0(0.0%)		
Way of dead chicken disposal	Burning	1 (2.3%)	15 (34.6%)	24 (54.5%)	4(9.1%)	37.620	0.000
	Burying	12 (10.4%)	66 (57.4%)	36 (31.3%)	1(0.9%)		
	Throwing	24 (26.4%)	46 (50.5%)	20 (22.0%)	1(1.1%)		
Slaughter of sick chickens	yes	16 (30.2%)	31 (58.3%)	6 (11.3%)	0(0.0%)	22.15	0.000
	No	21 (10.7%)	96 (48.7%)	74 (92.5%)	6(3%)		

Discussion

Results of the current study showed that 75.5% and 24.4% of the respondents were males and females, respectively. This result contradicts with the report of Meseret (2010), in Gomma district of Jima who reported the sex of the respon-

dents was 70% females and 30% males. Moreover, Hassen (2007), reported the proportion of females to males respondents of a study conducted in North West Ethiopia was 74.2% to 25.84%, respectively.

It is found that, 64% and 36% of the poultry producers were keeping their chickens in free range and intensive production systems, and 69.6% of them keep chickens primarily for income generation. This result is in close agreement with the report of Tadelle (2003), in Ethiopia who reported the primary reason of poultry producers to keep chickens was for generating income (65.1 %). Moreover, Hassen (2007), in South and North Western Ethiopia has reported, 71.4% of the respondents were keeping chickens primarily for income generation.

According to this study, 50.4% of the poultry producers did not prefer to rear cross breed chickens. Because, the informal communication with some of the producers indicated cross breed chickens have no characteristics of fleeing as well as making alarm sounds when they see predators. It is obvious that, good biosecurity in poultry farms is the best management practice to reduce and prevent the possibility of introducing different diseases. So, knowledge of biosecurity is paramount important. However, 67.6% of the poultry producers in this study did not have knowledge of biosecurity. According to Akidarju *et al* (2010), small scale farms are characterized by low levels of biosecurity and are more prone to the introduction of infectious agents. It was found that, 8.4% of the poultry producers in the present study were using separate cloths and shoes to prevent the entrance of diseases into the farm. This result is lower than the report of Birhanu *et al* (2015), who reported 75% of small scale commercial poultry farms in and around Mekelle town used separate cloths and shoes. This variation might be due to difference in the poultry producers' level of awareness on poultry farm biosecurity and access to facilities.

This study revealed that, 94.4% of the poultry producers have market problem for their products due to seasonal supply and demand fluctuation, product quality, seasons of the year, and customers' preference. Almost all (94%) of the poultry producers get good price for their chickens and chicken products during holidays and festival times. This is in agreement with the report of Mekonnen (2007), who reported the existence of variation in price mainly attributed to high demand for chickens for Ethiopian New Year and holidays. Majority of the poultry producers in the study area prefer egg and meat from local than

cross breed chickens. The premium for local birds is attributed to better meat flavor and more deeply colored egg yolks (Dessie and Ogle, 2001).

It is revealed that, 93.6% of the poultry producers in the current study complained the prevalence of diseases such as Newcastle disease, Fowl pox, Gumboro and coccidiosis and predators. This is in line with a study conducted in Fogera woreda by Bogale (2008), who reported the two major constraints of poultry production were diseases and shortage of supplementary feeds.

Consulting veterinarians (52.8%), treating with traditional medicines (14%), slaughtering for home consumption (6%) and selling (5.2%) were among the measures taken by the producers when their chickens got sick. Similarly, Mapiye *et al* (2005), stated that smallholder poultry producers respond differently in times of disease occurrence; they do nothing, use ethno-veterinary medicine, modern (conventional) medicine or medicine originally intended for humans.

This study indicated that, as poultry producers' level of education and farming experience advances, they consult to veterinarians and treat sick chickens instead of using for of home consumption, selling or treating traditionally. Educated and experienced poultry owners had good knowledge on biosecurity and dead chickens way of disposal. Moreover, poultry producers who were educated up to high school and above did not slaughter sick chickens for consumption instead they consult veterinarians and treat them.

Conclusion

Majority of the poultry producers complained lack of market for their products. The price and demand for chicken and chicken products was shown to depend on season and customers preference. The price is better during holidays than fasting periods, and chickens with red hair coat color are more preferred by the customers. New Castle, Gumboro, Fowl Pox and Coccidiosis were found to be the major poultry diseases in the study district. The poultry producers' level of education and farming experience were found highly associated with management of sick and dead chickens. There should be a good market linkage to solve the existing market constraints for chicken and chicken products. Provision of adequate veterinary services to prevent and control the major poultry diseases and capacity building on poultry production and husbandry practices are required.

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Conflict of interest

The authors declare that there is no conflict of interest.

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