

Full Length Research Paper

Study on management practices and marketing systems of village chicken in East Shewa, Ethiopia

Desalew Tadesse^{1*}, Harpal Singh², Ashenafi Mengistu², Wondimeneh Esatu³ and Taddesse Dessie⁴

¹College of Veterinary Medicine, Mekelle University, P. O. Box:231, Mekelle, Ethiopia,

²College of Veterinary Medicine, Addis Ababa University, P. O. Box: 34, Debre Zeit, Ethiopia.

³Debre Zeit Agricultural Research Center, P. O. Box 32, Debre Zeit, Ethiopia.

⁴International Livestock Research Institute, ILRI Addis, P. O. Box: 5689, Addis Ababa, Ethiopia.

Accepted 6 June, 2013

A cross sectional study was conducted with the objectives of assessing management practices and marketing systems of village chicken production from November 2011 to May 2012 in Ada'a and Lume districts of East Shewa, Ethiopia. Totally, 180 randomly selected respondents were included in the study from six purposively selected Peasant Associations (PA's) from two districts. In both districts, 97.8% of the respondents provided additional feed supplements. Over 95% of the respondents used maize and wheat as additional supplements, provided mostly three times per day. About 96% of respondents in both districts provided water with free access. Extension services were used by 41.2% in Ada'a and 53.4% respondents in Lume districts. Of the total respondents, 78.8% did not vaccinate their chicken in Ada'a, whereas 80% of the respondents vaccinate their chicken in Lume districts. Collectively, about 56% of the respondents provided Oxy-tetracycline 20% as prophylactic measures against various poultry diseases. There was a good market access for poultry production inputs in Ada'a than in Lume districts. However, there was better market access for sell of poultry products in Lume than in Ada'a district. Through introducing improved chicken management practices and market facility at village, the farmers' benefit could be enhanced from the poultry sector in these study areas.

Key words: Management practices, marketing system, village chicken.

INTRODUCTION

Village poultry production based mainly on a scavenging system is of enormous socio-economic significance, in terms of contribution to family nutrition and household food security throughout the developing world (Muchadeyi et al., 2007). Ethiopian Central Statistics Agency (CSA) (2013) reported that 96.9, 0.54 and 2.56% of the total poultry were reported to be indigenous, hybrid and exotic, respectively. The poultry sector in Ethiopia can be characterized into three major production systems, namely the large-scale commercial, the small

scale commercial and the village or backyard poultry production system. Each can sustainably coexist and contribute to solve the socio-economic problems of different target societies (Taddesse et al., 2003a). The backyard poultry production system is characterized by low input, low output and periodic destruction of large proportion of the flock due to disease outbreaks (Taddesse et al., 2003b).

The marketing system is generally informal and poorly developed. The existence of a local market offering good

*Corresponding author. E-mail: tdesalew@gmail.com.

sale opportunities and adequate transport facilities are obvious prerequisites for family poultry development (Branckaert et al., 2000). According to Gausi et al. (2004), smallholder village chicken producers tend to ignore new technology even when it appears to be better than their current practices due to market limitations. Lack of information on the performance, management, health program and marketing system makes it difficult to assess the importance and contributions of the past attempts to improve the village poultry production sector (Moges et al., 2010). Thus, the present study was designed to assess the management practices and marketing system of village chicken production in Ada'a and Lume districts of East Shewa, Ethiopia.

MATERIALS AND METHODS

Description of study areas

Lume district is located 70 km from Addis Ababa in East Shewa, Ethiopia with an altitude ranges from 1500 to 2300 meters above sea level (m.a.s.l.). The mean monthly temperature of the area ranges from 22 to 34°C (CSA, 2005). Ada'a district is located at 47 km from Addis Ababa with an altitude ranging from 1500 to 2250 m.a.s.l. (ILRI, 2005). The mean monthly temperature ranged from 21.6 to 31.5°C (DZARC, 2006).

Sample size determination and selection of study households

Sampled households in the study were determined by $N=0.25/SE^2$ according to Arsham (2005), where, N = Sample size, SE = Standard error. Three PAs from each district were selected purposively based on the extent and intensity of improved chicken distribution in these areas. The list of households, which adopted improved layer chickens from each PA was used as sampling frame. From the total of 215 households in three PAs (Momoshoki, Byobiskie and Jogogudedo) in Lume and from the total of 203 households in three PAs (Denkaka, Kurkuradenbi and Godino) in Ada'a districts, a total of 180 households (90 households from each district) were selected using systematic random sampling technique. The primary aim of this poultry improvement package is for table egg production to improve nutritional status and food security of households in two districts.

Data collection and analysis

Using cross sectional questionnaire surveys, information focusing on management practices such as the provision of housing, supplementation of additional feed, use of agricultural extension services, poultry health management practices and marketing systems were collected from member(s) of the households directly responsible for management and care of chicken. The data were analyzed using SPSS software, version 17 (SPSS, 2007).

RESULTS AND DISCUSSION

Household characteristics of respondents

The proportion of female respondents was higher than

that of males in both districts (Table 1). A higher proportion of female respondents than males revealed that village poultry rearing is mainly managed by females, agrees with Muchadeyi et al. (2007) and Khandait et al. (2011) as reported elsewhere. The analysis for educational status disclosed that 24.4% in Ada'a and 33.4% of the respondents in Lume were illiterates. The rest of the proportions in each of the districts were found to be capable of reading and writing, at least as a result of their exposure to formal education. Education status observed under the present study was much better than to those reported by Halima (2007) and Moges et al. (2010) in other parts of Ethiopia. The average family size per household was higher in Ada'a district, while in Lume, it was nearly similar to the national average of 5.2 (CSA, 2003). Total landholding per household was comparable with that reported by Moges et al. (2010).

Poultry housing system and facilities

The majority of respondents in both districts constructed a separate house entirely for poultry (Table 2). These proportions are higher than what were reported elsewhere (Moges et al., 2010; Mengesha et al., 2011) indicating that the level of farmers' awareness to the importance of poultry housing in these areas is better. The highest proportion of the respondents, 91.11% in Ada'a and 95.6% in Lume districts, constructed a separate house entirely for poultry, whereas from total respondents who constructed separate poultry house only 35.6 and 25.6% constructed based on recommended extension package in Ada'a and Lume districts, respectively. Poultry houses constructed from locally available materials, with well built wall, adequately ventilated with corrugated wire, equipped with watering and feeding materials and provided with litter material was considered as constructed based on the recommended government extension package for poultry housing. The lesser use of recommended specifications in poultry house construction indicates the lack of technical training on scientific poultry rearing to the producers in the study areas. Generally, it was also observed that few households residing near the town and main road to Addis Ababa provided electricity and litter material in poultry houses. Only 22.2 and 10% of the respondents in Ada'a and Lume districts, respectively, used litter for rearing chicken. Provision of electricity and litter material for village chicken was not reported in recent similar studies by Moges et al. (2010) and Takele and Ali (2011).

Feeding and watering practices

The assessment results of poultry feeding and watering practices in the study districts are presented in Table 3. The dominant system of poultry feeding practiced in both

Table 1. Household characteristics of respondents in Ada'a and Lume districts.

Variable	Ada'a (N=90)	Lume (N=90)
Sex of respondents (%)		
Male	34.4	30
Female	65.6	70
Average age of the respondents (years)	36.9	37.7
Educational status of respondents (%)		
Illiterate	24.4	33.4
Read and write	24.4	32.2
Elementary school	36.6	20
High school	13.4	11
College/ University	1.2	3.4
Average family size/household	5.5	5.3
Land holding/household (ha)		
Total land holding (Mean±SD)	1.1±1.26	1.4±1.25
Landless households (%)	13.9	17.8

Table 2. Poultry housing system and facilities used in Ada'a and Lume districts.

Poultry housing system and facilities	Districts					
	Ada'a, N=90		Lume, N=90		Cumulative	
	Freq.	%	Freq.	%	Freq.	%
Separate house constructed for poultry	82	91.11	86	95.6	168	93.3
Share the same house with people	4	4.44	4	4.4	8	4.4
Separate house with other animals	4	4.44	0.0	0.0	4	2.2
Constructed based on recommended package	32	35.6	23	25.6	55	30.6
Provision of electricity	24	26.7	12	13.3	36	20
Provision of adequate ventilation facility	80	88.9	67	74.4	147	81.7
Litter material used	20	22.2	9	10	29	16.1

Freq., frequency.

of the districts is free scavenging with supplementary feeding. However, the proportion of those that supplement their chicks with a commercial ration is very small. The majority above 94% respondents provided maize and wheat as additional supplements three times a day. The practice of additional feed supplementation to chicken by most of the respondents in both districts agrees with Halima (2007); Moges et al. (2010); and Mengesha et al. (2011) where 99, 97.5 and 98% feed supplementation by chicken owners, respectively, were indicated.

Information recorded for frequency of watering revealed that about 96% of respondents provided water with free access in both districts. The majority of the respondents used tap in Ada'a to their chicken, whereas borehole was the major water source in Lume district. Moges et al. (2010) and Mengesha et al. (2011) reported similar, watering practices in Bure district of North West Zone of Amhara region and Jamma district of South Wollo, respectively.

Use of agricultural extension and credit services

Agricultural extension services were provided as training focused on periodic supplementation of feeds, watering, housing and poultry health management. The result regarding extension service (Table 4) indicated that poultry farmers in Lume had better extension services than to those in Ada'a district. A similar picture about the extension services provision in Ada'a district was also reported by ILRI (2005). Collectively, nearly half of the respondents (47.2%) used the acquired knowledge from the training in poultry rearing practices.

Mengesha et al. (2011) reported comparable use of agricultural extension services by chicken owners in Jamma district of South Wollo, Ethiopia. Limited use of agricultural extension services might be due to drawback fear of farmers to the technology disseminated as reported by Dana et al. (2006). A small proportion of respondents were provided a credit facility only in Ada'a district. However, the farmers' interest to get credit

Table 3. Chicken feeding and watering practices in Ada'a and Lume districts.

Feeding and watering practices	Districts					
	Ada'a, N=90		Lume N=90		Cumulative	
	Freq.	%	Freq.	%	Freq.	%
Only scavenging	2	2.2	2	2.2	4	2.2
Scavenging with additional supplement	88	97.8	88	97.8	176	97.8
Purchased feed	3	3.4	2	2.3	5	2.8
Additional feed type						
Wheat and maize	85	94.4	86	95.5	171	94.9
Kitchen waste	90	100	90	100	180	100
Wheat bran	1	1.1	2	2.2	3	1.7
Limestone	2	2.2	2	2.2	4	2.2
Frequency of feeding						
Three times a day	73	81.1	69	76.7	142	78.9
Two times a day	17	18.9	21	23.3	38	21.1
Source and frequency of watering						
Frequency of watering						
Free access	87	96.7	86	95.6	173	96.1
Morning only	1	1.1	0.0	0.0	1	0.56
Morning and evening	2	2.2	4	4.4	7	3.9
Water sources						
Tap water	65	72.2	34	37.8	99	55.0
Borehole water	12	13.3	55	61.1	67	37.2
Pond water	0.0	0.0	1	1.1	1	0.55
River water	1	1.1	0.0	0.0	1	0.55
Canal water	12	13.3	0.0	0.0	12	6.7

Freq., frequency.

Table 4. Use of agricultural extension services in poultry production in Ada'a and Lume districts.

Agricultural extension services	Districts					
	Ada'a, N=90		Lume N=90		Cumulative	
	Freq.	%	Freq.	%	Freq.	%
Agricultural extension services used	37	41.2	48	53.4	85	47.2
Training and credit facility						
Training provided	26	28.9	34	37.8	60	33.3
Training before starting poultry production	23	25.6	32	35.6	55	30.6
Training after starting poultry production	3	3.3	2	2.2	5	2.8
Credit service provided	12	13.4	0.0	0.0	12	6.7
Purpose						
To buy day old chicks	12	13.4	0.0	0.0	12	6.7
To buy poultry house equipment	0.0	0.0	0.0	0.0	00	00
To buy chicken feed	0.0	0.0	0.0	0.0	00	00

service has been reported by Moges et al. (2010) and Takele and Ali (2011), but still availability of credit service is limited to village chicken owners. Majority of the respondents 43.3% in Ada'a and 41.1% in Lume districts

suggested supply of day-old chicks at affordable price by government, provision of annual vaccination and getting training on modern poultry rearing technologies as an option to improve poultry productivity.

Table 5. Use of anti-ectoparasites, prophylactic and culling practice in poultry in Ada'a and Lume districts.

Health care practices	Districts					
	Ada'a, N=90		Lume N=90		Cumulative	
	Freq.	%	Freq.	%	Freq.	%
Application of anti-ectoparasite	37	41.1	21	23.3	58	32.2
Vaccination	19	21.2	72	80	91	50.6
Prophylactic measures	50	55.6	51	56.7	101	56.1
Culling practice	90	100	90	100	180	100
Reasons for culling						
Poor productivity	25	27.8	42	46.7	67	37.2
Old age	46	51.1	35	38.9	81	45
Diseases	19	21.1	13	14.4	32	17.8

Table 6. Marketing practices and consumer preference for eggs and chicken in Ada'a and Lume districts.

Selling time and consumer preference	Districts					
	Ada'a		Lume		Cumulative	
	Freq.	%	Freq.	%	Freq.	%
Market access						
For production inputs	72	80	64	71.2	136	75.6
For eggs and chicken	62	68.8	85	94.4	147	81.7
Time and criterion of selling						
Specific weight gain/age	1	1.2	3	3.4	4	2.22
Personal money requirement	66	73.3	66	73.3	132	73.33
During holydays and festivals	22	24.4	21	23.4	43	23.9
Egg selling only for hatching	1	1.2	0.0	0.0	1	0.55
Consumer egg preferences						
Eggs from improved chicken	16	17.8	7	7.8	23	12.8
Eggs from local chicken	70	77.8	79	87.8	149	82.8
Equally preferred	4	4.4	4	4.4	8	4.4

Use of anti-ectoparasites, prophylactic measures and culling practices

In the present study areas, diseases were reported as the first major problem, where Newcastle disease (ND) was number one constraint of village chicken productivity in Ada'a and Lume districts. Similarly, Moges et al. (2010) reported ND as economically important diseases in North West Ethiopia. In both districts, the vaccination program was for Newcastle disease, infectious bursal disease, fowl typhoid and fowl pox. Significantly higher proportions of respondents practiced vaccination in Lume than in Ada'a district (Table 5). This was due to a coordinated effort by livestock experts and field veterinarians of Lume district.

However, studies conducted by Leta and Endalew (2010); Mengesha et al. (2011) and Takele and Oli (2011) revealed that none of the village chicken owners

practiced vaccination and prophylactic measures against poultry diseases. Poor productivity, old age and disease were claimed as the reasons for culling by all respondents. A similar culling practice was reported by Moges et al. (2010).

Marketing practices and consumer preferences

The results on marketing practices and consumer preference are presented in Table 6. There was a better market access for poultry production inputs in Ada'a than in Lume district. Such a difference could be due to the presence of more number of intensive poultry farms as well as production input suppliers in Ada'a district main town, Debre Zeit. However, higher number of respondents had better market access to sell their eggs and chicken in Lume than in Ada'a district. This might be

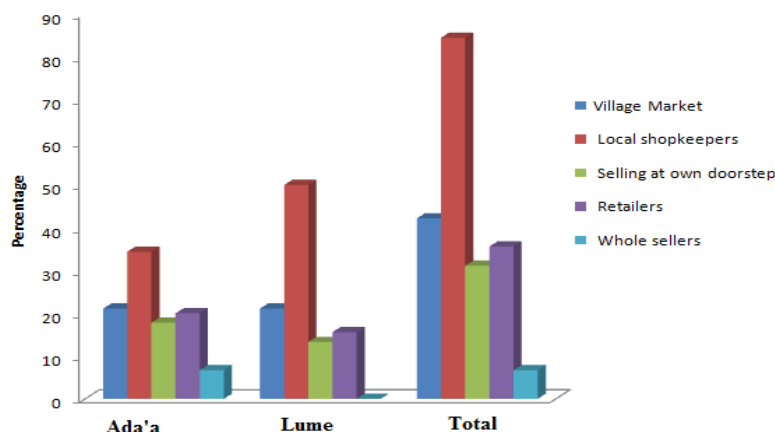


Figure 1. Selling practices for eggs and chicken in Ada'a and Lume districts.

because of the presence of more competitive for egg and chicken market at Ada'a district main town, Debre Zeit. The majority (73.3%) of the respondents both districts were selling their eggs and chicken according to their personal money requirement, particularly to use for the purchase of poultry feed. In both districts, respondents sell chicken and eggs using a calendar system to look for a good price during festivals and holidays. This reflected the fact that respondents preferred to sell at higher prices, as the price of eggs and chicken is highly related to holidays (Halima, 2007; Wilson, 2010; Dinka et al., 2010). However, a small number of respondents in both districts were selling their birds based on weight gain and age of the bird. In both districts, majority of respondents prefer eggs and meat from local chicken to exotic birds. The market price for eggs from local chicken was higher than improved breeds. The premium for local birds is attributed to better meat flavour and more deeply coloured egg yolks (Dessie and Ogle, 2001). However, at village level, significant difference in egg yolk colour may not be expected between local and exotic chicken, thus such difference might be for flavour and taste of the egg from local chicken. Interestingly, 17.8% in Ada'a and 7.8% in Lume districts prefer eggs from commercial chicken for their larger egg size, as egg from local chicken is considerably smaller than commercial layers (Sonaiya, 2004). However, a very few respondents (4.4%) had equal preference for eggs of local and commercial chickens in both districts.

As illustrated in Figure 1, a higher proportion of the respondents in both districts were selling their eggs and chicken to local shopkeepers. Approximately, similar proportions of the respondents in both districts were selling their eggs and chicken at village market.

A small number of respondents sell eggs and chicken to wholesalers in both districts. It is evident from the results that respondents were selling eggs and chicken at local shopkeepers, village market and doorstep. Tadelles et al. (2003b) and Khandait et al. (2011) have reported

similar selling practice of eggs and chicken at village level.

CONCLUSION AND RECOMMENDATIONS

In the present study, substantial evidences have been produced that witness the openness of the considered poultry production system for pursuing interventions to improve its performance aiming at improving the contribution of the poultry sector to household and the national economy. This was supported by the producers' willingness to make additional investments for housing, feeding and veterinary services. The largest proportions of the producers sell their products to local shopkeepers because of lack of processing and storage, and transport facilities which seriously affect the income that the farmers could get from their poultry operations if otherwise. Therefore, through introducing improved poultry management, providing veterinary services and marketing systems, the farmers' benefit could be enhanced from the poultry sector.

ACKNOWLEDGEMENTS

The authors are greatly indebted to the Koepon Stichting, Wageningen University (WU), Institute of Agricultural Research (EIAR) and International Livestock Research Institute (ILRI) for funding this research work and the farming communities from two of the districts for their time and for willingly participating in the survey which is instrumental for the successful completion of this research work.

REFERENCES

- Arsham H (2005). Questionnaire design and surveys sampling, 9th ed. <http://home.ubalt.edu/ntsbarsh/stat-data/Surveys.htm> (Retrieved July 15, 2012).

- Branckaert R, Gaviria L, Jallade J, Seiders R (2000). Transfer of technology in poultry production for developing countries. SD dimension. FAO <http://www.fao.org/sd/cddirect/cdre0054.htm>.
- Central Statistical Agency (CSA) (2003). Ethiopian Agricultural Sample Enumeration, 2001/2002. Statistical report on farm management practices, livestock and farm implements part II, Addis Ababa, Ethiopia. pp. 233.
- Central Statistical Agency (CSA) (2005). Agricultural Sample Survey 2004/05. Central Statistical Authority No. 2. Report on Livestock and livestock characteristics. Stat. Bull. P. 331.
- Central Statistical Agency (CSA) (2013). Agricultural sample survey 2012/13. Report on livestock and livestock characteristics, Statistical Bulletin Addis Ababa, Ethiopia. 2:570.
- Dana N, Duguma R, Teklewold H, Aliye S (2006). Transforming village poultry systems into small agro-business ventures: a partnership model for the transfer of livestock technologies in Ethiopia. *Livestock Research for Rural Development*. P. 18, Article #169. Retrieved February 5, 2013, from <http://www.lrrd.org/lrrd18/12/dana18169.htm>.
- Dessie T, Ogle B (2001). Village poultry production system in the Central Highlands of Ethiopia. *Trop. Anim. Health Prod.* 33:521-537.
- Dinka H, Regassa C, Fufa D, Endale B, Leta S (2010). Major Constraints and Health Management of Village Poultry Production in Rift Valley of Oromia, Ethiopia. *Am.-Eur. J. Agric. Environ. Sci.* 9(5):529-533.
- Debre Zeit Agricultural Research Center (DZARC) (2006). Unpublished Metrological Data.
- Gausi JCK, Safalaoh ACL, Banda JW, Ng'ong'ola DH (2004). Characterisation of the smallholder poultry marketing systems in rural Malawi: A case study of Malingunde Extension Planning Area. *Livestock Research for Rural Development*. P. 16, Art. #97. Retrieved on February 5, 2013, from <http://www.lrrd.org/lrrd16/12/kaus16097.htm>.
- Halima H (2007). Phenotypic and Genetic Characterization of Indigenous Chicken Populations in Northwest Ethiopia. PhD Thesis; University of the Free State, Bloemfontein, South Africa. P. 186.
- International Livestock Research Institute (ILRI) (2005). Ada'a Liben Wored Pilot Learning site Diagnosis and Program Design in Addis Ababa, Ethiopia. 63:6-11.
- Khandait VN, Gawande SH, Lohakare AC, Dhenge SA (2011). Adoption Level and Constraints in Backyard Poultry Rearing Practices at Bhandara District of Maharashtra (India). *Res. J. Agric. Sci.* 2(1):110-113.
- Leta S, Endalew B (2010). Survey on Village Based Chicken Production and Utilization System in Mid Rift Valley of Oromia, Ethiopia. *Global Veterinaria* 5(4):198-203.
- Mengesha M, Tamir B, Dessie T (2011). Village Chicken Constraints and Traditional Management Practices in Jamma District, South Wollo, Ethiopia. *Livestock Research for Rural Development*. Volume 23, Article #37. Retrieved February 5, 2013, from <http://www.lrrd.org/lrrd23/2/meng23037.htm>.
- Moges F, Abera M, Taddelle D (2010). Assessment of village chicken production system and evaluation of the productive and reproductive performance of local chicken ecotype in Bure district, North West Ethiopia. *Afr. J. Agric. Res.* 5(13):1739-1748.
- Muchadeyi FC, Wolny CBA, Eding H, Weigend S, Makuza SM, Simianer H (2007). Variation in village chicken production systems among agro-ecological zones of Zimbabwe. *Trop. Anim. Health Prod.* 39:453-546.
- Sonaiya E (2004). Direct assessment of nutrient resources in free-range and scavenging systems. *World's Poult. Sci. J.* 60(4):523-535.
- Statistical Package for Social Sciences (SPSS) (2007). Statistical Package for Social Sciences for windows. User's guide: Statistics version 17. Inc. Cary, NC.
- Taddelle D, Million T, Alemu Y, Peters KJ (2003a). Village chicken production systems in Ethiopia: 1. Flock characteristics and performance; *Livestock Research for Rural Development* (15) 1. Retrieved February 5, 2013, from <http://www.lrrd.org/lrrd15/1/tadea151.htm>.
- Taddelle D, Million T, Alemu Y, Peters KJ (2003b). Village chicken production systems in Ethiopia: 2. Use patterns and performance valuation and chicken products and socio-economic functions of chicken; *Livestock Research for Rural Development* (15) 1. Retrieved February 5, 2013, from <http://www.lrrd.org/lrrd15/1/tadeb151.htm>.
- Takele T, Oli W (2011). Uses and flock management practices of scavenging chickens in Wolaita Zone of southern Ethiopia. *Trop. Anim. Health Prod.* 44:537-544.
- Wilson RT (2010). Poultry production and performance in the Federal Democratic Republic of Ethiopia. *World's Poult. Sci. J.* 66:441-454.