

Assessment of Locally Available Poultry Feeds, Feeding Practices and Health in Sidama Zone and Halaba Special Woreda in SNNPR

Bangu Bekele

South Agricultural Research Institute, Hawassa Agricultural Research Center
P.O Box -06

Abstract

This study was conducted with the objective of assessing and recommending chicken feed resources and feeding practices for chicken in study areas. Three woredas (two woredas from Sidama and Halaba special woreda) were included in the study and 40 respondent farmers were involved from each woreda. Different cereals, pulses horticultural crops and kitchen wastes were identified as locally available chicken feed in the study areas. Farmer's practices of supplementation of different feed types for different classes of chickens in different seasons were also identified mostly in Shebedino and Dale woreda. But in all study area, the feeding system was on the bare ground by mass feeding of different classes of chicken specially in Halaba special woreda as well as Dale. Also, lack of awareness, cost of feed, lack of feed and feed ingredients are major problems of supplementation. As a result indicated, seasonal variability of disease, lack of veterinary services, feed shortage and predators major constraints in the study area that hastate production and productivity of chicken.

Key words: indigenous chicken, local feed and feeding practices

1. Introduction

The total chicken population of Ethiopia is about 57 million (CSA, 2015), and kept for both eggs and meat production purposes. Nearly all (99.27 %) are raised under a traditional or extensive management system (Halima *et al.*, 2007). Local chickens in Ethiopia play a vital role in many poor rural households, they provide scarce animal protein in the form of meat and eggs and can be sold or bartered to meet essential family needs such as medicine, clothes, food items that are not grown under farmers' field, sanitary items like soap and school fees and they are required for special festivals and for many traditional ceremonies. They are generally owned and managed by women and children and are often essential elements of female-headed households.

In developing countries like Ethiopia, the overall standard of husbandry is mainly scavenging type and usually poor because of the low level of inputs and in addition, there are a considerable number of constraints to village poultry production (Tadelle, 2001). Farmers are reluctant to increase their level of inputs into local chicken production due to the high mortality normally encountered in their flocks (Tadelle, 1996). The fertility of layers and hatchability are satisfactory as each hen usually hatches about 8 to 12 chickens, however on average only 2 to 4 chickens from each clutch raised to maturity Mavale (2001). There are many constraints that have to be solved in order to increase survivability and production of local chickens.

Village poultry is the first step on the ladder for poor households to tackle poverty. Rural poultry production in Ethiopia represents a significant part of the national economy in general and the rural economy in particular, and contributes 98.5 and 99.2% of the national egg and poultry meat production, respectively (AACMC, 1984), with an annual output of 72,300 metric tonnes of meat and 78,000 metric tonnes of eggs (ILCA, 1993). Comparatively little research and development work has been carried out on village poultry, despite the fact that they are more numerous than commercial chickens, accounting for around 99% of the total number in the country. Studies carried out at the College of Agriculture, Alemaya (Bigbee, 1965) and Wolita Agricultural Development Unit (WADU) (Kidane, 1980) and by the Ministry of Agriculture (1980) indicated that average annual egg production of the native chicken was 30-60 eggs under village conditions and that this could be improved to 80-100 eggs on-station.

Through using available natural resources efficiently, Family Poultry (FP) constitute an important component of the agricultural and household economy in LIFDCs, a contribution that goes beyond direct food production for the fast growing human population as well as employment and income generation for resource-poor small farmers, especially women (Guèye 2002a). They also serve as a means of capital accumulation and as a barter product in societies where there is no circulation of currency. Furthermore, they are closely linked to the religious and socio-cultural lives of several million resource-poor farmers for whom poultry ownership ensures varying degrees of sustainable farming and economic stability. Additionally FP have medicinal and environmental functions. Therefore, the overall contribution provided by FP at household, community and country levels is generally underestimated since the multitude of roles played by poultry in LIFDCs are generally ignored, in part because they are extremely difficult to assess (Guèye 2002b).

Comparatively little research and development work has been carried out on village chicken feeds,

feeding practices and health despite the fact that they are more numerous than commercial chickens, accounting for around 99% of the total number in the country. So, this study has designed with the following objects.

1.1. Objectives:

- To assess locally available poultry feed resources in the study area.
- To identify feed ingredients and feeding practices of chickens in a farmer level.
- To recommend appropriate feeding practices.

2. Methodology

The study was conducted in two woredas of Sidama zone (Shebedino and Dale) and Halaba special woreda of SNNPR, Ethiopia. From each woreda, two kebeles and a total of six kebeles were used for the survey. From each of the selected kebeles, 20 households were randomly selected. Accordingly, a total of 120 (20 HHs x 2 kebeles x 3woredas) households were used in the survey.

Data were collected using multiple subject formal survey using a pre-tested, structured questionnaire. Data collected include: household characteristics (family size, farmland holding and chicken flock size per household); various productivity of chicken; Chicken management practices including (housing, feeding (feed availability, types and frequency of feeding), and diseases and health care practices (major types, occurrences, symptoms and severity of diseases, and coping mechanism).

Qualitative and quantitative data sets were analyzed statistically using Statistical Package for Social Sciences (SPSS) software, version 20.

3. Result and Discussion

3.1. Locally available chicken feed resources and its sources in the study woreda.

Table 2. Locally available chicken feed resources and its sources in the study woreda.

Feed types and their sources	Woreda			Total (N=120hh)	X ²	
	Shebedino (n= 40hh)	Dale (n=40hh)	Halaba (n= 40hh)			
wheat grain	produced	11.1%	6.7%	50.0%	14.3%	9.904
	purchased	88.9%	93.3%	50.0%	85.7%	
Maize grain	produced	100.0%	92.5%	93.3%	94.6%	1.476
	purchased	0.0%	7.5%	6.7%	5.4%	
Barely	produced	0.0%	10.8%	18.2%	9.1%	3.032
	purchased	0.0%	0.0%	0.0%	90.9%	
Oat grain	produced	0.0%	0.0%	0.0%	96.9%	1.466
	purchased	0.0%	5.3%	0.0%	3.1%	
cereal debris (remains)	Produced	94.1%	94.9%	100%	95.5	.577
Source of HH scrap (left over)	Produced	100.0%	100%	100%	100%	22.130
Scavenging	In and around home	90.0%	87.5%	89.5%	89.0%	2.538

hh = interviewed households; χ^2 = chi square; ** = significant $p \leq 0.01$

As result indicated on above table, locally available or mostly used as a chicken feed are wheat grain , maize grain, cereal debris, kitchen left over's and scavenging type of feeding with different percent is most common in all study area (Shebedino, Dale and Halaba). Among the grains, maize contains highest percent and uniformly/commonly found in all study area because it was produced from their own farm and second most common consumable food especially in Sidama zone following kocho and fist mostly used for home consumption food also in Halaba special woreda. But even if there were such kind of feed produced from their own farm, there was also competition with human as it has being available for human consumption so, that made high shortage of feed for the poultry production (Adugna et al 2012) that production and productivity of livestock in different parts of the country is low due to multidimensional constraints. Among the numerous bottlenecks, shortage of feed supply and poor nutritional quality of available feed resources are the major constraints affecting livestock productivity. Also, that hinders productive potential for local chicken this is in line with reports of Mbugua, 1990 that feed shortage restricts the potential productivity of local birds to 40-60 eggs per hen per year. Both egg production and egg size vary with season, as the quality and availability of feed varies Then kitchen left over's and scavenging type of feeding become only life reserving option for village chicken in

study area, it is closely related with work done by Dwinger *et al.*, 2003 that, Family poultry production in Africa survives by scavenging and generally, no supplements provided except that some times, household waste fed to the birds and other circumstances the diet supplemented with grain.

3.2. Feeding practices of village chicken

Table .2. Supplementary feed Source of chicken, time of supplementing, frequency of feeding

Type and sources of supplementary feeds	Woredas			Total (N=120)	X ²	
	Shebedino(n=40)	Dale (n=40)	Halaba (n=40)			
concentrates/ industrial by-products source	Factories	0.0%	15.4%	0.0%	9.2%	6.618
	Retailers	94.4%	74.4%	75.0%	80.0%	
	Feed mills	5.6%	10.3%	25.0%	10.8%	
Time of supplementing	In the morning before they go out for scavenging	73.7%	60.0%	33.3%	58.1%	15.341
	In the evening after scavenging	10.5%	2.5%	33.3%	10.8%	
	In the afternoon while scavenging	5.3%	5.0%	0.0%	4.1%	
	Any time during day times	10.5%	32.5%	33.3%	27.0%	
Frequency of purposeful feeding	Once	100.0%	57.5%	77.8%	72.7%	12.043
	Twice	0.0%	22.5%	11.1%	14.3%	
	Three times or more	0.0%	20.0%	11.1%	13.0%	
Ways of feeding	In a feeder	26.3%	30.0%	19.7%	26.0%	4.235
	On the bare ground	73.7%	70.0%	80.4%	72.7%	
Extra feeds feeding	Separate to different classes	78.9%	70.0%	22.2%	61.0%	15.317
	Together for the whole groups	21.1%	30.0%	77.8%	39.0%	
Reasons for supplementing	Egg yield	47.4%	47.5%	77.8%	54.5%	12.4
	Meat yield	0.0%	5.0%	11.1%	5.2%	
	All	52.6%	47.5%	11.1%	40.3%	
Place of supp. Feed provision	Indoor	0.0%	55.9%	77.8%	47.8%	22.939
	outdoor	100.0%	44.1%	22.2%	52.2%	

hh = interviewed households; χ^2 = chi square; ** = significant $p \leq 0.01$

As study showed, in study area there was some chicken feed supplementation practices from their own consumption food mostly during the morning e specially Shebedino and Dale in high level.

However, in the Halaba special woreda, it was mostly in the morning and evening this is in line with The result Asefa (2007) and Mekonnen (2007) who reported 95 -98% of the small scale household poultry producers in Awassa Zuria and Dale offer supplementary feeding to their chickens and somehow with the results/reports that “Family poultry production in Africa survives by scavenging and generally, no supplements provided except that some times, household waste fed to the birds and other circumstances the diet supplemented with grain (Dwinger *et al.*, 2003)”. For the additional supplementation some farmers bought from retailers (94.4%, 74.4% and 75%) and feed mills (5.6%, 10.3% and 25%) Shebedino, Dale and Halaba respectively mainly to obtain egg production especially in Halaba (77.8%) this is similar with that of [6] who reported that the main objective of poultry keeping by villagers was production of eggs marketing and for home consumption (Tadelle. D., *et.al.* 2003). But in all study area, farmers have fed their chickens on bare ground separating them to different classes mostly in Shebedino (78.9%) and Dale (70%) woreda. But relatively in Halaba special woreda, most farmers have fed their chickens together with whole groups (77.8%) compared with Shebedino (21.1%) and Dale (30%) woredas.

3.3. Common type of chicken diseases

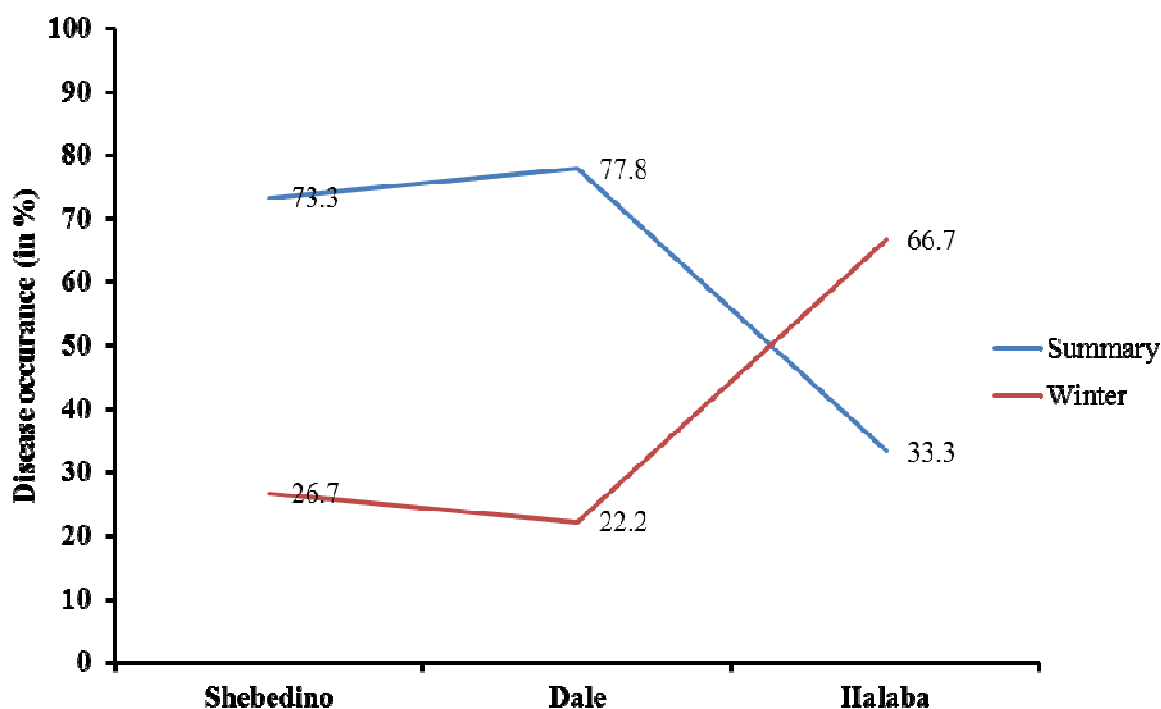
Table 4. Most common type of chicken diseases experienced in the study area

Diseases	Wereda		
	Shebedino	Dale	Halaba
Gunfan	40.0%	13.5%	16.7%
Fengil	18.3%	34.0%	17.0%
Shibanet	16.8%	26.8%	15.0%
fowl pox	0.0%	2.6%	0.0%
fowl cholera	0.0%	1.8%	0.0%
coccidiosis	14.0%	7.7%	33.3%
Total	100%	100%	100%

As table above indicated some of diseases identified i.e. gunfan (40.0%, 13.5%, 16.7%), fengil (18.3%, 34.0%, 17.0%), shibanet (16.8%, 26.8%, 15.0%) and coccidiosis (14.0%, 7.7%, 33.3%) are most commonly found in Shebedino, Dale and Halaba special woreda respectively each According to the some studies 'The major problem impairing the existing production system in Ethiopia is the high incidence of Newcastle disease, which named locally "fengil" (Holye, 1992; Alemu and Tadelle, 1997; Solomon 2004). also according to Negussie and Ogle (1997), New castle disease accounted for the largest proportion of overall flock mortality to be 57.3% followed by fowl pox 31.6%, coccidiosis 9.4% and predator loss 1.7% and Research work in some African countries such as Benin (Chrysostome *et al.*, 1995), Burkina Faso (Bourzat and Saunders, 1990), Mauritania (Bell *et al.*, 1990) and Tanzania (Yongolo, 1996) reported that Newcastle is the most devastating disease in village chickens. Also in a little percent fowl pox and cholera were observed in Dale woreda in Sidama zone. As a respondents/study showed, their occurrence and symptoms percent in each woreda was the same. This all mainly because of poor manage mental conditions as well as rearing system that exposes chickens to diseases.

3.4. Seasons of most diseases occur

Figure 2. Season of most disease occurrence in study area (in a %)

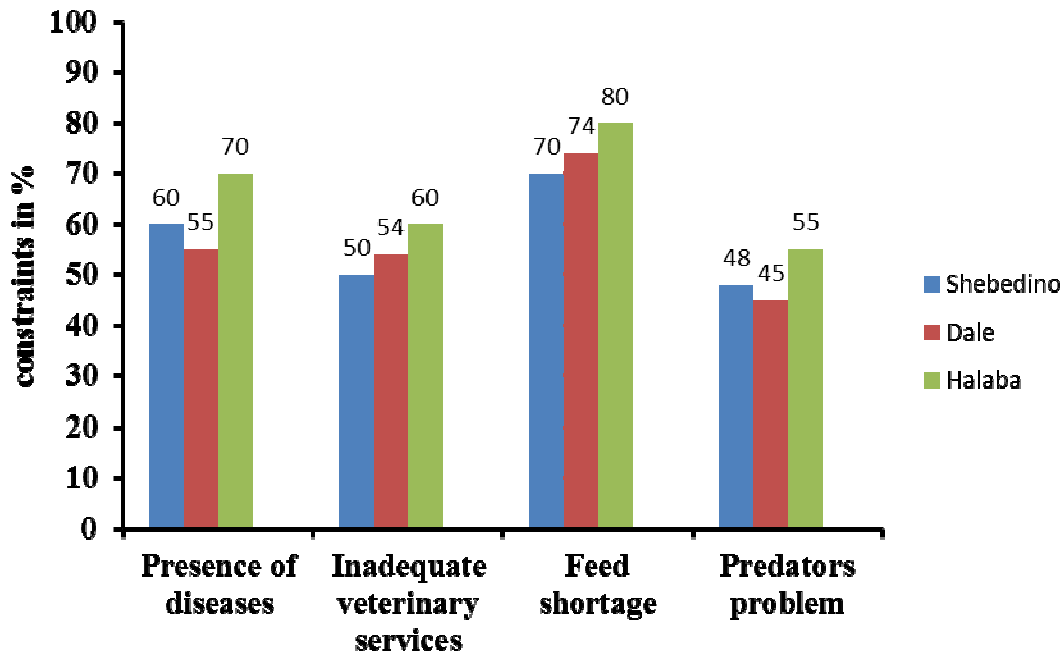


On the above graph 1, indicated some of the most common disease occurring seasons were identified in the study area i.e. gunfan, fengil, shibanet, coccidiosis and sometimes fowl pox and cholera specially in Dale woreda were commonly occurring mostly summer specially Shebedino and Dale in Sidama zone. But in the Halaba special woreda, all diseases expressed above were occurred in the winter/dry season. This is because as respondents explained, hot environmental conditions. This in line with some work done in the world about Newcastle disease i.e. In Bangladesh, outbreaks of ND are more frequent during the winter season (Asadullah, 1992), and in Zambia (Sharma et al, 1986) during the hot dry season (September to November) and the hot

humid season (January to March). The highest incidence of ND in rural poultry in Uganda is reported during hot and dry periods of the year (George, 1991, 1992). In addition to that, another disease that was identified as a major cause of village chicken death was coccidiosis that was said to occur often during winter relatively in Halaba special woreda. Although this could not be verified, some farmers purportedly used local herbal medicines for treatment of various poultry diseases.

3.5. Constraints of chicken production in study area

Figure 2. Constraints of poultry production in study area (0.01% CI)



As indicated on the above graph 2, there were some of the constraints tried to indicate in the study area that mostly occurred and hindered the production and productivity of poultry. Some of the problems that occurred in the study area were predator problem and presence of diseases that vary relatively 55%, 48%, 45% and 70%, 60%, 55% in Halaba, Shebedino and Dale respectively that increases the loss of village chicken because farmers didn't give any attention about chicken care and follow their health as reported by Halima Hassen (2007) from Northwest Ethiopia that most (72.43 %) farmers do not properly examine their chicken and provide no health management services. In the study area mostly affected predators were, foxes, hawk (at the early stage of chicks), cats as reported by Mekonnen G/gziabher, 2007 from the southern part of Ethiopia where snakes, rats, dogs, cats and foxes were the main predators that caused losses especially in young birds. Similarly, according to Abera M., 2000 report from the Southern part of Ethiopia wild birds (eagle, hawk, etc.) are the most common predators during the dry season while wild cat (locally known as "Shelemetmat") is the most dangerous predator during the rainy season. Also this is in agreement with the report of Hoyle, E., 1992 and Negussie, D., 1999 where disease and predators were known to be the major causes of mortality in the country. Also, the others were inadequate veterinary services and feed shortage varying from 60%, 54%, 50% and 80%, 74%, 70% in Halaba special woreda, Dale and Shebedino woredas respectively. This is in line with reports that Feed resources are a major input in poultry production systems, estimated to account for about 60 percent of total production costs in the commercial poultry sector Gueye, E.F., 2003. In village chicken production systems, it is difficult to estimate the economic and/or physical value of this input because there are no direct methods of estimating the scavenged feed resource which constitutes most of the feed input Roberts, J.A. and S.P. Gunaratne, 1992.

Generally, as a result indicated all of the problems observed in the study area, relative occurrences of them were high in Halaba special woreda. As a reason it might be effect of ecology, awareness of smallholder farmers, access to input availability and veterinary service

4. Conclusion and recommendations

In the study area, most of the chicken feed resources are maize gain (produced from their own farm) and household leftovers (remains) are mostly common. Although, scavenging contain highest percent. In a few amount, there was a supplementary practices especially in Dale and Shebedino woreda from their home consumption to obtain mainly egg production during early morning applying on the bare ground. The feed

shortage, predatory, poor health services are most common problem in all study area and it increases from Shebedino, Dale and Halaba. The reason was awareness. The summer was mostly disease (Gunfan, Fengil and Coccidiosis) occurrence season in Shebedino and Dale but not Halaba for that, winter is common relatively.

Generally, feeds in quantity and quality as well as feeding system (bare ground, mass feeding) was not appropriate to increase production and productivity of chicken in rural area and there was inadequacy of veterinary services. So, to enhance chicken productivity in rural area there should be done:-

- ✓ Awareness creation
- ✓ Pre-disease control mechanisms (vaccination) depending on the season.
- ✓ Further action research work should be done that participated farmers and included full-fledged poultry package vastly.

Also training for farmers and extension staffs focusing on diseases control, improved housing feeding and for the development of farmers awareness about the sector should be arranged to be successful the production and productivity of village chicken under farmers level in the region and Government should train community chicken vaccinators to provide wide spread vaccination against major poultry diseases in the study areas. In addition to this, There should be collaboration with the different stakeholders from research centers, University, NGO and extension workers to apply modern poultry production technology under farmers level and they should give attention in all aspects to village poultry sector and its development.

5. References.

- Aberra, M., 2000. Comparative studies on performance and physiological responses of Ethiopian indigenous (Angete Melata) chickens and their fl crosses to long term heat exposure. PhD dissertation, Martin-Luther University. Halle- Wittenberg Germany, pp: 127.
- Alemu, Y., and Tadello D., 1997. The status of poultry research and development in Ethiopia, research bulletin No.4, poultry commodity research program Debrezeit Agricultural researchcenter. Alemaya University of agriculture, Ethiopia. pp. 62.
- Asadullah, M. 1992. Village chickens and Newcastle disease in Bangladesh. In Spradbrow, P.B., ed. Newcastle disease in village chickens: control with thermo stable oral vaccines. ACIAR Proceedings, No. 39. Canberra, Australia, ACIAR
- Asefa, T., 2007. Poultry management practices and on farm performance evaluation of Rhode Island Red (RIR), Fayoumi and local chicken in Umbullo Wachu watershed. M.Sc. Thesis presented to the school of graduate studies of Hawassa University, Awassa, Ethiopia.
- Australian Agricultural Consulting and Management Company (AACMC), 1984. Livestock sub sector review, Volume 1.
- Bell, J.G., Kane, M. & Le Jan, C. 1990. An investigation of the disease status of village poultry in Mauritania, preventive veterinary medicine, 8(4): 291–294.
- Bourzat, D. & M. Saunders. 1990. Improvement of traditional methods of poultry production in Burkina Faso. In proceedings, CTA seminar; 3rd international symposium on poultry production in hot climates, Hameln, Germany, 12 June 1987.
- Chrysostome, C.A.A.M., Bell, J.G., Demey, F. & Verhulst, A. 1995. Seroprevalences to three diseases in village chickens in Benin. Preventative veterinary medicine, 22(4): 257–261.
- Dwinger, R.H, Bell, J.G. and Permin, A. 2003. A program to improve family poultry production in Africa. B.P. 6268, Rabat-Institutes, Morocco.
- Gueye, E.F., 2003. Poverty alleviation, food security and the well-being of the human population through family poultry in low income food-deficit countries. Senegalese Institute of Agricultural research (ISRA), B.P. 2057, Dakar-hann, Senegal.
- Guèye, E.F. 2000. The role of family poultry in poverty alleviation, food security and the promotion of gender equality in rural Africa. *Outlook on Agriculture*, 29(2) 129–136(8)(availableat <http://www.ingentaconnect.com/content/ip/ooa/2000/00000029/00000002/art00007>).
- Guèye, E.F. 2002. Family poultry research and development in low-income food-deficit countries: approaches and prospects. *Outlook on Agriculture*, 31(1): 13–21 (availableat <http://www.ingentaconnect.com/content/ip/ooa/2002/00000031/00000001/art00003>).
- Halima Hassen, 2007. Phenotypic and genetic characterization of indigenous chicken populations in northwest Ethiopia. PhD Thesis. University of the Free State, Bloemfontein, South Africa.
- Hoyle, E., 1992. Small-scale poultry keeping in Welaita, North Omo region. Technical pumpbulet No. 3 Farmers Research Project (FRP). Farm Africa Addis Ababa.
- International Livestock Research Center for Africa (ILCA). 1993. Handbook of African livestock statistics. ILCA, Addis Ababa, Ethiopia.
- Kidane, H., 1980. Performance of F1 crosses breeds. Welaita Agricultural Development Unit. Animal husbandry and breeding. Welaita Sodo, Ethiopia. Bulletin No. 4:33p.

- Mbugua, N.P., 1990. Rural smallholder poultry production in Kenya. In Proceedings, CTA Seminar on Smallholder Rural Poultry Production, Thessaloniki, Greece, 9–13 October, 1990. Vol. 2, pp. 119–131.
- Mekonnen G/gziabher, 2007. Characterization of the small holder poultry production and marketing system of dale, wonsho and loka abaya weredas of snnprs. MSc Thesis. Hawassa University.
- Negussie, D., 1999. Evaluation of the performance of local Rhode Island Red (RIR) and Fayoumi breeds of chicken under different management regimes in the high lands of Ethiopia. *Tropical Animal Health and Production*, 33: 521-537.
- Negussie, D. and Ogle, B., 1999. On farm evaluation of Rhode Island Red (RIR) and local chickens under different management regimes in the high land of Ethiopia. M.Sc thesis, presented Swedish University of Agricultural Sciences, pp 79.
- Roberts, J.A. and S.P. Gunaratne, 1992. The scavenging feed resource base for village chickens in a developing country. Proceedings, 19th World's Poultry Congress, Vol. 1, 822-825, The First IFNPD/FAO Electronic Conference on Family Poultry.
- Solomon, D., 2000. Suitability of home made hay-box chick brooder to the Ethiopian household poultry production system. Jimma University College of Agriculture and Veterinary Medicine, Jimma, Ethiopia
- Tadelle D (2003). Phenotypic and genetic characterization of chicken ecotypes in Ethiopia. Ph.D. Thesis, Humboldt University of Berlin, Germany, pp. 144-152.
- Tadelle, D. 1996. Studies on village poultry production systems in the Central Highlands of Ethiopia. MSc. Thesis. Swedish University of Agricultural Sciences, Uppsala, Sweden.
- Tadelle, D. and Ogle, B. 2001. Village poultry production system in the central high lands of Ethiopia. *Tropical Animal health and production*, 33:521-537.
- Yongolo MGS (1996). Epidemiology of Newcastle disease in village chickens in Tanzania. MVM Thesis, Sokoine University of Agriculture, Tanzania, p. 234.