

Poultry sector country review



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This review is based on the following report:
HPAI prevention and control strategies in Eastern Africa,
The structure, marketing and importance of the commercial and
village poultry industry: An analysis of the poultry sector in Ethiopia

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Foreword

The unprecedented widespread outbreaks of Highly Pathogenic Avian Influenza (HPAI) that occurred in many countries in Asia, Europe and Africa since 2003 have been asking for rapid and active response on a national, regional and international level. The HPAI crisis had to be addressed worldwide at the source, which is the poultry population.

The main danger of this disease, like others, lies in the way in which humans interact with and handle the production, distribution, processing and marketing of live poultry and poultry products. The direct and indirect socio-cultural and economic impacts of disease outbreaks influence policy measures and disturb markets, causing the loss of assets. There are strong negative impacts on the livelihoods of rural communities for all producer groups including small holders. Assessment and guidance on measures along the poultry chain for a safe poultry production is therefore of great importance. Specific consideration should be given to strategies and measures that ensure a sustainable pro poor supporting approach and development.

Better understanding of the specific situations of the different poultry sectors and the related market chains will help to develop appropriate disease control measures and improve biosecurity.

This review is part of a series of Country Reviews that are commissioned by the Animal Production Service (AGAP) of the Food and Agriculture Organization of the United Nations (FAO) for the Socio-Economics, Production & Biodiversity Unit of the Emergency Centre for Transboundary Animal Disease of FAO (ECTAD).

This review is intended as a resource document for those seeking information on the poultry sector at national level. It is not exhaustive. Some topics are only partially covered or not covered at all and the document will be supplemented and updated on an ongoing basis. Contributions and feedback are welcome by the author(s), FAO/AGAP and FAO/ECTAD Socio-Economics, Production & Biodiversity Unit¹.

The original report by Solomon Demeke was edited by Ms Jenny Schwarz in September 2008 and has been supplemented with data from the FAO statistical database (FAOSTAT), the World Bank and the United Nations Population Division.

¹ For more information visit the FAO website at: www.fao.org/avianflu/en/farmingsystems.html or contact either Philippe Ankers or Olaf Thieme, Animal Production Officers Email: Philippe.Ankers@fao.org and Olaf.Thieme@fao.org Food and Agriculture Organisation, Animal Health and Production, Viale delle Terme di Caracalla, 00153 Rome, Italy.

Contents

Foreword	i
Acronyms and abbreviations.....	iv
CHAPTER 1	
The country in brief.....	1
CHAPTER 2	
Profile of the poultry sector	3
2.1 National poultry flock.....	3
2.2 Geographical distribution of poultry flocks.....	4
2.3 Production	6
2.4 Consumption	6
2.5 Trade	6
2.6 Prices	7
CHAPTER 3	
Poultry production systems	8
3.1 Background information	9
3.2 Sector 1: Industrial and integrated production.....	9
3.3 Sectors 2 and 3: Other commercial production systems	10
3.3.1 Breeding stocks and hatching eggs	10
3.3.2 Broiler meat	10
3.3.3 Hen table eggs	10
3.3.4 Other species	10
3.4 Sector 4: Village or backyard production	10
3.4.1 Chickens.....	10
3.4.2 Other species	14
3.5 Poultry value chain analysis.....	14
3.5.1 Day-old chicks.....	15
3.5.2 Chicken meat	15
3.5.3 Table eggs	15
3.5.4 Other species	15
CHAPTER 4	
Trade, marketing and markets.....	16
4.1 Domestic market.....	16
4.2 Import.....	16
4.3 Export	16
4.4 Slaughtering facilities	16
4.5 Poultry Feeds	16
CHAPTER 5	
Breeds	19
5.1 Exotic breeds.....	19
5.2 Local breeds.....	20

CHAPTER 6	
Veterinary health, public health, biosecurity measures	22
6.1 Highly pathogenic avian influenza	22
6.2 Other major poultry diseases	23
6.3 Biosecurity measures	25
CHAPTER 7	
Current policies, legal framework	27
CHAPTER 8	
Analysis	28
8.1 Current strengths and weaknesses of the poultry sector	28
8.2 Prospects of the poultry sector over the next five years	28
ANNEX I	
Who is who (contact list)	29
ANNEX II	
List of major projects – poultry sector	30
ANNEX III	
References	32
ANNEX IV	
Bibliography	34
ANNEX V	
Maps	40

Acronyms and abbreviations

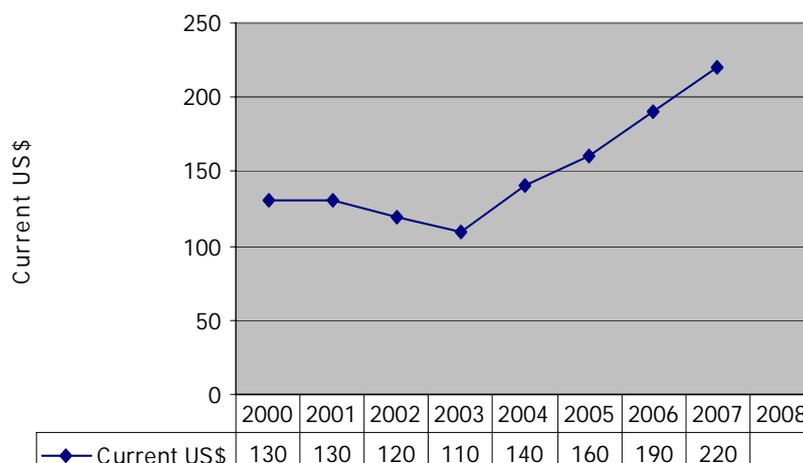
CACC	Central Agricultural Census Commission
DFID	Department for International Development
EARO	Ethiopian Agricultural Research Organization
ETB	Ethiopian Birr
FAO	Food and Agriculture Organization of the United Nations
HPAI	Highly Pathogenic Avian Influenza
IAR	Institute of Agricultural Research
IBD	Infectious Bursal Disease (Gumboro)
IFAD	International Fund for Agricultural Development
JUCAVM	Jimma University, College of Agriculture and Veterinary Medicine
MoARD	Ministry of Agriculture and Rural Development
NGO	Non Governmental Organizations
NVI	National Veterinary institution
OIE	Office International des Epizooties
RSBA	Regional State Bureaus of Agriculture
SNNPR	Southern Nation and Nationality people Region
TOR	Terms of Reference
USAID	United States Agency for International Development
USOM	United State Operational Mission

Chapter 1

The country in brief

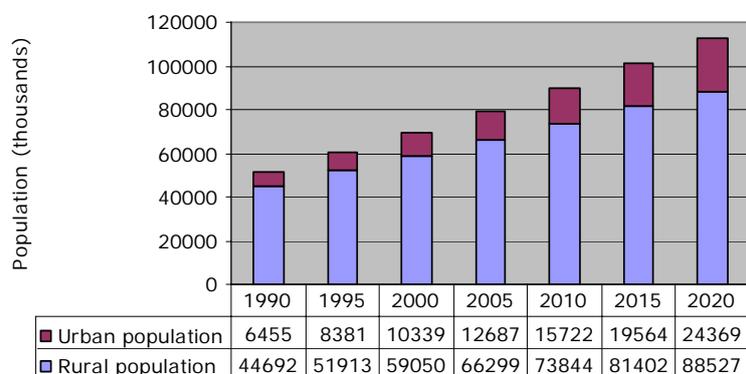
Country:	Ethiopia		
Location:	Eastern Africa, west of Somalia		
Population, total	79,086,894 (2007)	Source:	World Bank, September 2008
Population, growth rate:	2%	Source:	World Bank, September 2008
Economy group:	Low income	Source:	World Bank, September 2008

FIGURE 1: Gross national income (GNI) per capita
(Atlas method, current US\$)



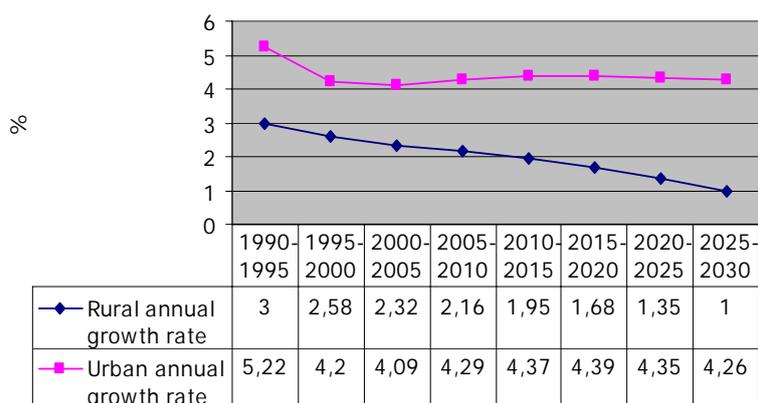
Source: The World Bank Group World Development Indicators, September 2008

FIGURE 2: Demographic profile



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, <http://esa.un.org/unup>, September 2008

FIGURE 3: Annual population growth rates

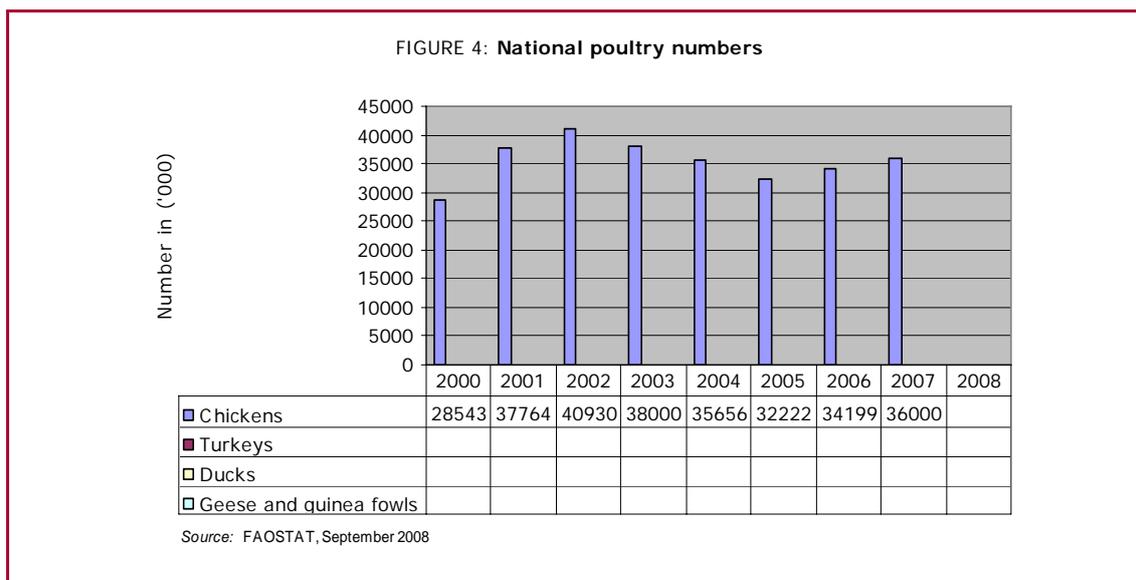


Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, <http://esa.un.org/unup>, September 2008

Chapter 2

Profile of the poultry sector

2.1 NATIONAL POULTRY FLOCK



According to CACC, about 42%, 18%, and 40% of the national poultry population are chicks up to 8 weeks, growers aged 9 to 20 weeks and adult birds of more than 20 weeks respectively. About 31 % of the total national standing chicken population is hens of which about 16% are non layers. According to the Central Statistical Authority (2004-2005) about 98% of the total national poultry population consists of indigenous chickens and the remaining 2% consists of the introduced exotic breeds of chickens.

There has been a gradual decline in the Ethiopian poultry population. According to Burley (1957) and the Central Statistical Authority (2004-2005), the Ethiopian poultry population was estimated at 85 and 31 million in 1954 and in 2005 respectively. The Sub-Sector Review (1984) estimated the average number of chickens per household at 6.5 in 1984 whereas the average number of chickens per household is estimated at 4.1 in 2003 (CACC, 2003). These figures show that the country's poultry population has declined by 64% over the last 50 years, while the average number of chickens per household has declined by 37% over the last 20 years.

2.2 GEOGRAPHICAL DISTRIBUTION OF POULTRY FLOCKS

TABLE 1:
The Ethiopian Indigenous chicken population and distribution by regions

Geographic Area	Number of households	No of chickens	% of the total	No. of chicken/household
Tigray	697,755	4,999,678	11.7	7.2
Afar	28,423	56,376	0.13	1.9
Amhara	3,068,035	13,434,878	31.1	4.4
Oromia	4,082,343	14,784,303	34.4	3.6
Somali	111,172	154,746	0.04	1.4
Benshangul-Gumuz	126,872	961,196	2.23	7.6
S.N.N.P	2,437,616	8,106,038	18.8	3.3
Gambella	31,913	237,930	0.7	7.5
Harari	14,634	33,046	0.07	2.3
Addis Ababa	25,616	100,163	0.23	3.9
Diredawa	17,918	2,034	0.11	2.6
Total	10,490,015	42,915,628	100	4.1

Source: CACC, 2003

The four major Regional States in terms of land area and human population (Oromiya, Amhara, SNNP, and Tigray) collectively account for about 96% of the total national poultry population. Chicken rearing is not common in the lowlands of Ethiopia i.e. Somali, Gambella, Afar and Benishangul-Gumze Regional States, which collectively own 3.24% of the total national chicken population.

Oromiya region has about 34.4% of the total national chicken population and contributes 36% of the total annual national egg and poultry meat production. The region's rural areas constitute about 97.1% of the total regional chicken population while the urban areas constitute 2.9%. The Regional State is divided into 12 Administrative Zones of which North, East and West Shewa Zones together account for more than 25% of the total regional chicken population, followed by East and West Welega Zones, contributing about 18% of the region's chicken population. Arsi and Jimma Zones each account for about 12% of the total regional chicken population.

Almost all the available commercial poultry farms of the country are located in Oromiya region specifically in and in the vicinity of Debre Zeit (Table 2).

TABLE 2:
Commercial farms in the vicinity of Addis Ababa

Location	Farm	Layers	Broilers
Addis Ababa	Fantu	Nil	12,000
Addis Ababa	Selam	2, 000	Nil
Addis Ababa	Hope Enterprise	3, 000	Nil
Addis Ababa	Getachew and Assefa	Nil	12, 000
Debre Zeit	Tsedey	Nil	20, 000
Debre Zeit	Almaz	Nil	50,000
Debre Zeit	Ex-soldiers coop.	Nil	18,000
Debre Zeit	Kale Hiwot Church	12, 000	9,000
Debre Zeit	Abeba	2, 500	Nil
Debre Zeit	Jegnoch Amba	3, 000	Nil
Debre Zeit	Alemayehu	Nil	9, 000
Debre Zeit	Wondem	Nil	50, 000
Debre Zeit	Adamu Hailu	Nil	16, 000
Nazreth	NACID	11,000	Nil
Sebeta	Mekonen	Nil	12,000
Total		33, 500	208, 000

Source: Alemu Yami, 1997

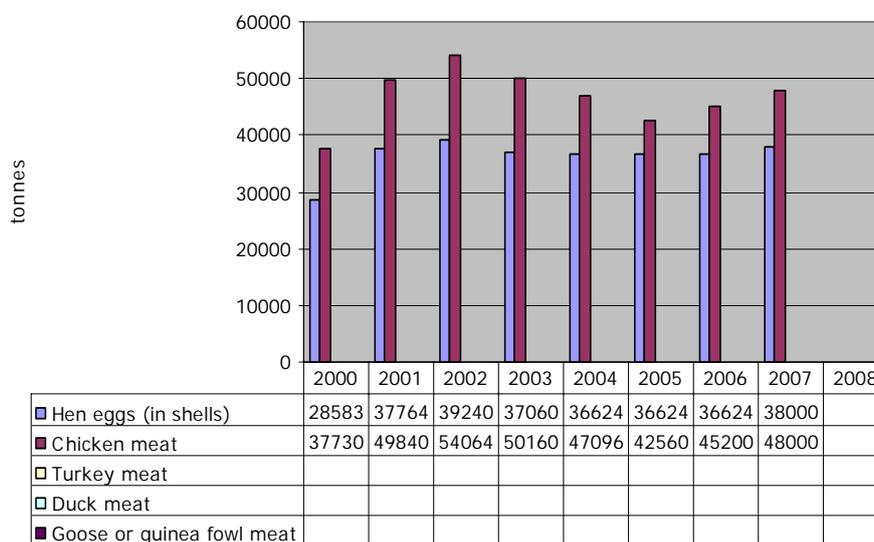
The Amhara region has about 31.3 % of the total national poultry population and contributes about 28% of the total annual national egg and poultry meat production. The regional rural areas constitute about 97.8% of the total regional chicken population while the urban areas constitute 2.2%.

The Regional State is divided into 10 Administrative Zones and North Gonder, West Gojam, South Wello and South Gonder Zones together account for more than 65% of the total regional chicken population. There are no large commercial poultry farms in the region. There are 5 small scale modern poultry farms under construction (Personal communication with Gezahegn, Manager of the Kombolisha poultry breeding and rearing centre). The Regional State has two breeding and multiplication centres (Kombolisha and Andessa). The Kombolisha centre established in 1985 and located in the industrial town of Kombolisha is the largest of all at the national level, whereas Andessa - located about 15 km from the regional capital, Bahir Dar - is medium in size and volume of production. The current capacity of the Kombolisha centre is about 70,000 pullets/cockerels, 175,000 - 345,000 day old chicks, 270,000 hatching eggs and 1,200 tonnes of formulated poultry feed per year (Amsalu Asfaw, 2003).

The Southern Nation and Nationality People (SNNP) Regional State is organized into 19 administrative zones and holds about 18.8% of the total national chicken population, contributing about 18% of the total annual national egg and poultry meat production. The rural areas comprise about 97.9 % of the total regional chicken population while the urban areas constitute 2.1%. Sidama, Gurage and Hadiya Zones together account for about 43.6% of the total regional indigenous chicken population. There are no large commercial poultry units in this region. The Regional State Bureaus of Agriculture (RSBA) operate 4 poultry breeding and multiplication centres (Awassa, Walayita Sodo, Gubre and Bonga). Tigray Regional State is organized into 5 Administrative Zones and holds about 11.65% of the total national indigenous chicken population, contributing about 15% of the total annual national egg and poultry meat production. The regional rural areas constitute about 80.9% of the total regional chicken population while the urban areas constitute 19.1%. West and Central Tigray Zones together account for about 70% of the total regional poultry population. The Regional MoARD operates one poultry breeding and multiplication centre located in Mekelle.

2.3 PRODUCTION

FIGURE 5: National production of the poultry sector



Source: FAOSTAT, September 2008

2.4 CONSUMPTION

Figure 6.a and 6.b: Poultry meat (in average calories/capita/day) (in kg/capita/year)

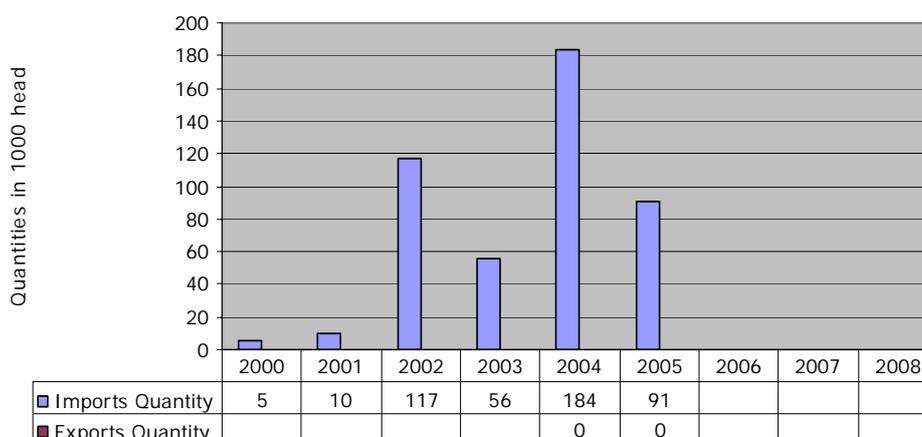
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Figure 6.c and 6.d: Eggs (in average calories/capita/day) (in eggs/capita/year)

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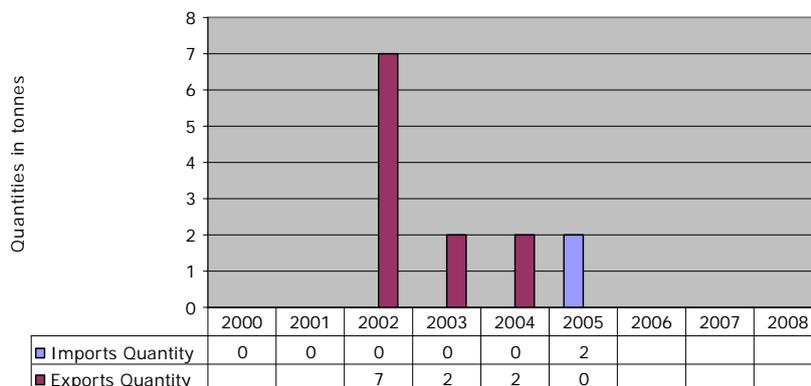
2.5 TRADE

FIGURE 7.a: Import/Export of live chickens (up to 185 g. only)



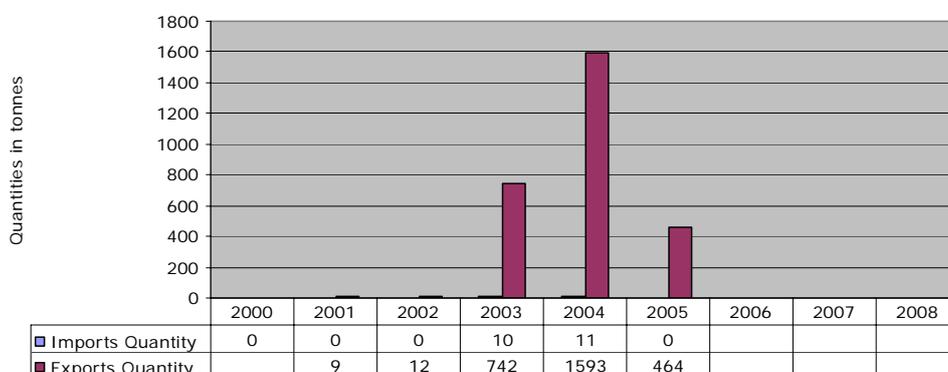
Source: FAOSTAT, September 2008

FIGURE 7.b: Import/Export of chicken meat



Source: FAOSTAT, September 2008

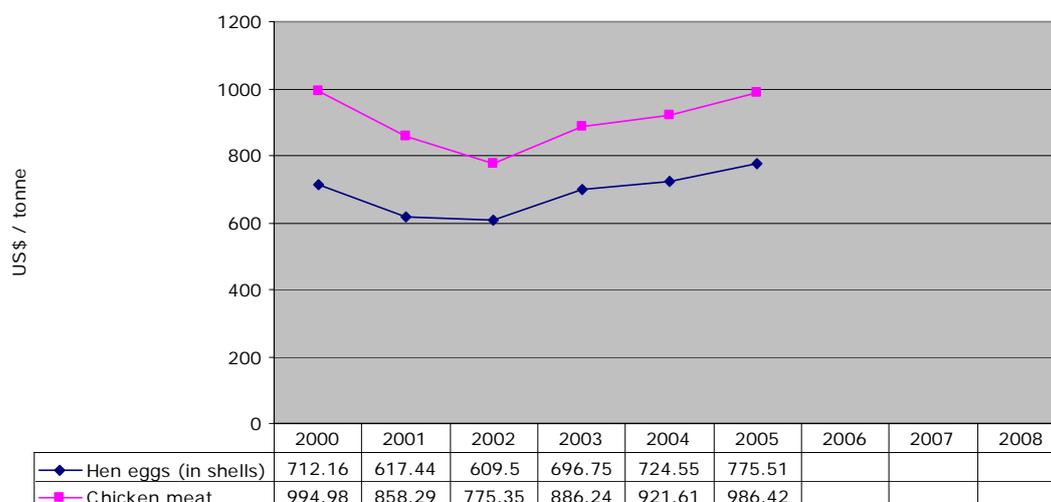
FIGURE 7.c: Import/Export of hen eggs (with shells)



Source: FAOSTAT, September 2008

2.6 PRICES

FIGURE 8: Producer price (US\$/tonne)



Source: FAOSTAT, September 2008

Figure 9: Consumer price (US\$/tonne)

This information has not yet been sourced.

Chapter 3

Poultry production systems

TABLE 3:
FAO classification of poultry production systems

Sectors (FAO/definition)	Poultry production systems			
	Industrial and integrated	Commercial		Village or backyard
		Bio-security		
		High	Low	
Sector 1	Sector 2	Sector 3	Sector 4	
Biosecurity	High	Mod-High	Low	Low
Market outputs	Export and urban	Urban/rural	Live urban/rural	Rural/urban
Dependence on market for inputs	High	High	High	Low
Dependence on goods roads	High	High	High	Low
Location	Near capital and major cities	Near capital and major cities	Smaller towns and rural areas	Everywhere. Dominates in remote areas
Birds kept	Indoors	Indoors	Indoors/Part-time outdoors	Out most of the day
Shed	Closed	Closed	Closed/Open	Open
Contact with other chickens	None	None	Yes	Yes
Contact with ducks	None	None	Yes	Yes
Contact with other domestic birds	None	None	Yes	Yes
Contact with wildlife	None	None	Yes	Yes
Veterinary service	Own Veterinarian	Pays for veterinary service	Pays for veterinary service	Irregular, depends on govt vet service
Source of medicine and vaccine	Market	Market	Market	Government and market
Source of technical information	Company and associates	Sellers of inputs	Sellers of inputs	Government extension service
Source of finance	Banks and own	Banks and own	Banks and private ²	Private and banks
Breed of poultry	Commercial	Commercial	Commercial	Native
Food security of owner	High	Ok	Ok	From ok to bad

Sector 1: Industrial integrated system with high level of biosecurity and birds/products marketed commercially (e.g. farms that are part of an integrated broiler production enterprise with clearly defined and implemented standard operating procedures for biosecurity).

Sector 2: Commercial poultry production system with moderate to high biosecurity and birds/products usually marketed commercially (e.g. farms with birds kept indoors continuously; strictly preventing contact with other poultry or wildlife).

Sector 3: Commercial poultry production system with low to minimal biosecurity and birds/products entering live bird markets (e.g. a caged layer farm with birds in open sheds; a farm with poultry spending time outside the shed; a farm producing chickens and waterfowl).

Sector 4: Village or backyard production with minimal biosecurity and birds/products consumed locally.

² Money lenders, relatives, friends, etc.

3.1 BACKGROUND INFORMATION

High (tertiary) level agricultural education, research and extension were established in Ethiopia in the early 1950's, when the Jimma Agricultural Technical School (JATS), Alemaya College of Agriculture (ACA), United State Operational Mission (USOM) Agricultural projects and the first four Agricultural Experiment Stations (Jimma, Alemaya, Debre Zeit and Shashemene) were established. Poultry was one of the programmes that started at that time. The poultry research projects conducted during those early years were exploratory and dealt with the appraisal of the country's poultry population (indigenous chicks), breeds, utility and their productivity. Four breeds of exotic chickens (Rhode Island Red, Australorp, New Hampshire and White Leghorns) were imported from Kenya, Denmark and the United States to Jimma and Alemaya in 1953 and 1956 respectively. Trials and experimental activities in the area of poultry housing, feeding, brooding, management and disease and parasite control were initiated soon after importation at Jimma, Alemaya and Debre Zeit (Wiggins, 1958).

All three experimental stations (Jimma, Alemaya and Debre Zeit) played key roles in the establishment phase of the current modern poultry sector and the national poultry extension system of the country. They served as sources of improved birds and fertile eggs along with reliable information as to the best methods of housing, feeding, management and marketing of poultry. The activities of the experiment stations were further strengthened with the establishment of modern poultry farms starting in 1959, all of which were involved in the distribution of exotic genotype to urban poultry producers (Herduck, 1961). On top of these, the Ministry of Agriculture established seven multiplication centres in different parts of the country to enhance the national poultry extension activities. Currently there are several small and large scale commercial poultry farms and feed processing mills in the town of Debre Zeit and in and around Addis Ababa.

ACA and JATS were nationally responsible for agricultural research until 1965. Ethiopia institutionalised agricultural research with the establishment of the Institute of Agricultural Research (IAR) and other regional development projects starting in 1966. The IAR, however, did not take up poultry research as one of its research programmes. Poultry research thus far has therefore been undertaken only by institutions of higher learning. Poultry was identified as one of the commodity research programmes with the establishment of EARO in 1997 (Yami and Dessie, 1997). Very few attempts have been made to review the Ethiopian poultry sector; the Ethiopian Livestock Sub-sector review (1984) is one of the successful attempts, and the resulting document is the most widely referred and cited in Ethiopian agriculture.

3.2 SECTOR 1: INDUSTRIAL AND INTEGRATED PRODUCTION

There are more than 20 private large scale commercial poultry production farms, all of which are located in and around Addis Ababa, particularly in and around Debre Zeit (Yami and Dessie, 1997).

ELFORA, Alema and Genesis are the top 3 largest commercial poultry farms with modern production and processing facilities. Established in 1997, ELFORA has large scale poultry farms at 4 different locations and sub-locations. ELFORA has modern broiler processing (slaughter houses) and packing units and produces table eggs, broiler meat and day old chicks. The slaughtering service has a capacity of 500,000 kg/year. ELFORA annually delivers around 420,000 chickens and over 34 million eggs to the markets in Addis Ababa (www.ethiomarket.com elfora). Alema Farm is the second largest enterprise delivering nearly half a million broilers to Addis Ababa market every year. It has its own parent stock from Holland, a feed processing plant, hatchery, slaughtering plant, cold storage and transport facility at its sites of operation. Genesis farm is the third most important private poultry enterprise with over 10,000 layers and its own parent stock and hatchery (Wossene, 2006). Genesis farm is the major source of breeding stock and commercial feed for the modern private poultry sector (Yami and Dessie, 1997).

Eight of the modern poultry farms (ELFORA Agro Industry, Alema, Almaze, Genesis, Kalehiwot, Sinkinesh, Tseday and Bora chicken farms) have formed a poultry farmers association known as "The Ethiopian Poultry Farmers Association" (<http://www.ethiopianreporter>). These eight farms fall under Sector 1 of the FAO classification

3.3 SECTORS 2 AND 3: OTHER COMMERCIAL PRODUCTION SYSTEMS

In Ethiopia, the commercial poultry (sectors 1 and 2 of FAO classification) are run as full time businesses, highly dependant on the market for inputs. The owners are wealthy by Ethiopian standards. The small scale modern poultry farms (sector 3) are run either as supplementary to the family income or as a full time business. Reliable economic data concerning the value of commercial poultry products sold in any one year is not available. The general indications are that the intensive poultry industry plays a key role in supplying poultry meat and eggs to urban markets at a competitive price. The industry also provides employment for a range of workers from poultry attendants to truck drivers to professional managers.

There are about 18 large scale commercial (with 2,500 to 50,000) poultry farms located in and around the capital with a collective capacity of 33,500 layers and 208,000 broilers per annum. Table and fertile eggs, day old chicks and broilers meat are the major products of these farms.

There is also an emerging small scale intensive system in urban and peri-urban areas, which corresponds to sector 3 of the FAO classification. Under this system of production, a small number of exotic breeds of chickens (50-1,000) are produced along commercial lines using relatively modern management methods. This activity is being undertaken as a source of income in and around major cities and towns such as Debre Zeit. Most of these farms obtain their feeds and foundation stocks from Genesis and Alema commercial poultry farms and occasionally from nearby government owned breeding and multiplication centres. They are also involved in the production and supply of table eggs to various supermarkets, kiosks and small roadside restaurants through middlemen.

Comparatively larger scale intensive poultry production is also practiced at government poultry multiplication and distribution centres located in various regions such as Adama, Bedelle, Awassa, Bonga, Kombolisha, Andessa and Mekele breeding and rearing centers

3.3.1 Breeding stocks and hatching eggs

There are government-owned poultry breeding and rearing centres aimed at providing improved dual purpose chickens of exotic breeds.

The Ethiopian higher education and research institutions run a number of modern poultry farms with the objectives of training and research. The institutions distribute fertile eggs, baby chicks and pullets and cockerels for MoARD, NGOs and individuals. The MoARD operates a total of 14 modern breeding and/ or rearing centres. Some of them have hatchery units, brooder and layers houses, and veterinary clinic and feed processing units. The centres directly import fertile eggs and day-old chicks of dual purpose chickens (commonly RIR) as a parent stock. During the last 5 years (prior to February 2006) the centres suffered from a shortage of financial resources, lack of replacement breeding stocks and periodic disease outbreaks.

3.3.2 Broiler meat

This information has not yet been sourced.

3.3.3 Hen table eggs

This information has not yet been sourced.

3.3.4 Other species

A duck farm recently opened at Chancho, Oromiya regional state, importing day old ducklings from France.

3.4 SECTOR 4: VILLAGE OR BACKYARD PRODUCTION

3.4.1 Chickens

The traditional production system as currently practised in Ethiopia falls under sector 4 of the FAO classification.

There is no exact figure indicating the number of people raising poultry at the household level. However, it is believed that all the estimated agricultural households (10.5 million) are engaged in small scale poultry production using indigenous chickens in different parts of the

country depending on climatic conditions. The flock size per household is estimated at 4.1 birds at the national level whereas a higher flock size (7.2 to 7.6) is reported from the Regional States of Tigray, Benishangul-Gumuz and Gambella. The flock sizes reported from all the other Regional States is below national average (CACC, 2003).

The traditional poultry production system is characterised by small flock sizes, low input and output and periodic devastation of the flock by disease. There is no separate poultry house and the chickens live in family dwellings together with the human population. There is no planned feeding of chickens and scavenging is almost the only source of diet. There is no planned breeding. It is by natural incubation and brooding that chicks are hatched and raised all over rural Ethiopia. A broody hen hatching, rearing and protecting few chicks (6-8) ceases egg laying during the entire incubation and brooding periods of 81 days. Yet the successes of the hatching and brooding process depends on the maternal instinct of the broody hen and prevalence of predators in the area, such as birds of prey, pets and some wild animals, all of which are listed as the major causes of premature death of chicks in Ethiopia (Demeke, 2007).

The mean survival rate to age 3 months of baby chicks reared under the natural brooding condition in Ethiopia is about 40% (Sub Sector Review 1984; Hoyle 1992; Ethiopian Statistical Authority 1985-1996), indicating that the broody hen ceases egg laying for 2.7 months for the purpose of rearing 2.8 chicks to an age of 3 months. Artificial chick brooding should be adopted to initiate an improvement in poultry production in Ethiopia. Hay-box chick brooding technology (developed at JUCAVM) - in which no artificial heat is employed - seems to be a brooder of choice by small-scale poultry producers in Ethiopia (Demeke, 2007). The hay-box brooders used to raise batches of 10 to 70 baby chicks consist of 4 outer framing boards, mesh-wire floors, central nests, door and 4 small ventilation holes drilled at the top of each frame board (total of 16 holes per box). Hay is stuffed very loosely between the sides of the boxes and the central nests and the tops of the boxes covered with sacks filled with hay. Chicken runs of appropriate dimensions are constructed and fitted to each box. The boxes and runs are thoroughly cleaned, splashed with boiling water, repaired and re-used when required.

Keeping village poultry has become challenging due to the periodical and recurrent outbreak of poultry diseases and the high prevalence of predators (Hoyle, 1992). Alamargot (1987) reported a mortality rate of 20-50% in indigenous chickens due to disease. During some periods of epidemics, mortalities as high as 80% have been recorded. Recurrent outbreaks of Newcastle Disease at similar frequencies – usually once or twice a year – demonstrate the endemic behaviour of the disease in village poultry populations (Yami and Dessie 1997). This situation calls for an improvement in nutrition, housing condition and health services in the traditional poultry production sub-sector.

TABLE 4:
Estimated number of indigenous chickens by category for rural and urban holdings (2003)

Category	Rural		Urban		Total	
Cocks	3,628,062	8.45	148,570	0.35	3,776,632	8.80
Cockerels	3,158,193	7.36	123,689	0.29	3,281,882	7.65
Pullets	4,491,021	10.46	172,636	0.40	4,663,657	10.87
Non laying hens	1,903,043	4.43	256,088	0.60	2,159,131	5.03
Chicks	17,420,187	40.59	477,805	1.11	17,897,992	41.7
Laying hens	10,329,121	24.07	807,212	1.88	11,136,333	25.93
Total	40,929,629	95.4	1,986,000	4.63	42,915,629	100

Source: CACC, 2003

TABLE 5:
Estimated annual egg production of village poultry (2003)

Geographical area	No. of agricultural Households	Average Family size	No of laying hens	Annual egg production (tonnes)	Per capita egg production (units)
Tigray	697,755	5.0	1,411,830	3,854	28.0
Afar	29,607	4.8	13,273	28	6.0
Amhara	3,068,035	4.8	3,156,655	7,387	13.0
Oromia	4,082,343	5.4	4,033,869	9,439	11.0
Somali	111,172	5.6	56,169	142	6.0
Benishangul	126,872	4.9	195,082	456	19.0
SNNP	2,437,616	5.1	2,143,850	4,599	9.0
Gambella	31,913	4.8	56,787	133	22.0
Harari	14,634	5.0	10,260	24	8.0
Addis Ababa	25,616	5.8	39,652	116	20.0
Dire Dawa	17,918	5.3	18,905	41	11.0
Total	10,490,015		11,136,333	26,059	

Source: CACC, 2003

The Amhara and Tigray regional states collectively own about 43% of the total national poultry population and the average number of chickens per household (flock size) is estimated at 7.2 and 4.4 in Tigray and Amhara regional state respectively, the values of which are above that of the national average of 4.1. Annual poultry meat and egg consumption per household is estimated at 2.19 Kg and 1.72 kg respectively in the Tigray regional state as compared to the national average of 0.12 and 0, 14 kg respectively. Similarly, the annual live bird and egg sale per household is estimated at 6 chicken and 100 eggs respectively in the Tigray Regional State. At current market price, these figures represent an annual income of Birr 322 from household poultry, indicating that village poultry in extremely poor areas of the country play important economic, nutritional and socio-cultural roles in the livelihoods of the rural households.

According to Gueye (2007) rural households in these areas value most highly the possibility of cash income from poultry keeping and believe that village poultry act as a "starter" that enables people to raise themselves and their families from degrading poverty to a stronger livelihood. According to Aklilu (2007), village poultry is the first step on the ladder for poor households to climb out of poverty. It is also the only capital that households have left when livelihoods are threatened by various reasons such as drought. An important function of poultry is their bartering value. Layers and cocks are exchanged for farm implements in remote areas where there is no circulation of currency. For example, in Alaje Woreda, two layers or cocks are bartered for a Maresha (the traditional ox-plough).

Poultry is a source of self-reliance for women, since poultry and egg sales are decided by women (Aklilu et al., 2007) and provide women with an immediate income to meet household expenses such as food. Moreover, poultry are used for strengthening marriage partnerships and social relationships. In the local culture, particularly in remote areas of Tigray and Amhara regions, women who can provide men with food like a chicken dish (Doro wot) are considered to be contributing to a stable marriage. Serving Doro Wot is also a demonstration of respect to guests, thus strengthening a social relationship which is especially important for poor households. For the poor, poultry meat is the only special meal they can afford during religious festivities like New Year, Christmas and Easter. Church leaders and attendants are also served with chicken dishes. In general, socio-cultural roles are more important in areas with the poorest market access particularly in the Tigray regional state (Aklilu, 2007).

In contrast, the Afar, Somali, Gambela, Harari, Addis Ababa, Dire Dawa and SNNP regional/administrative states collectively own 20% of the national poultry population. The average number of chickens per household of these regional states ranges between 1.4 and 3.9, all of which are lower than that of the national average, indicating that the role of village

poultry in the livelihoods of the rural community of these regional states is not as important as that of the rural community of northern Ethiopia. In fact, there seems to be a decline in the role of poultry at the household level in these parts of the country (CACC, 2003), despite the fact that the market demand and price of live chickens and eggs experienced during the last 5 years (except at a time of the outbreak) are high compared to the previous times. The demand for exotic fertile eggs, chicks, pullets/cockerels and culled layers distributed from the breeding and rearing centres is also very high (market survey and personal communication with managers of the breeding centres and chicken traders). Unfortunately however, keeping village poultry in some areas (example SNNPR) became untenable due to the periodical and recurrent outbreak of poultry diseases, coupled with predation (Hoyle, 1992).

According to Hoyle (1992) eggs have never been among the top ten animal products consumed at the household level in rural areas of SNNP Regional State. There are some case studies in which farmers are asked to rank the importance of poultry against other categories of food materials in the SNNP Regional State. The results indicated that both eggs and chickens have never been among the top ten means of survival and income generation. For poor families, poultry are often one of their few sources of petty cash and so the birds are kept for sale rather than home consumption (Bush 2006). The yearly income ranges from ETB 50 to over ETB 300 and is largely under the control of women. This income is significant for poor families with ETB 300 a year representing 25% of the typical annual income of poor families in SNNPR (Bush 2006).

In a study conducted by Dessie, Tadelle and Ogle (1996) on poultry production systems in the highlands of Ethiopia, it was observed that women look after the birds and the earnings from the sale of eggs and chicken are often their only source of cash income (Tables 6 and 7). It is therefore, important to actively involve women in the process of poultry improvement, which has actually been neglected in the past.

TABLE 6:
Ownership of poultry in three villages in the central high lands of Ethiopia from January to December, 1995 (30 households surveyed in each village)

Village	Category of owner (%)		
	Schoolboys/girls	Women	Others
Derek Wonz (high altitude)	21	72	7
Gende Gorba (medium altitude)	16	82	2
Awash (Low altitude)	10	87.5	2.5
Average	15.2	80.5	3.8

Source: Tadelle and Ogle, 1996

TABLE 7:
Ownership of poultry in two peasant associations in Welaita, North Omo region, Ethiopia

Village	Category of owner (%)				
	Senior men	Senior women	Boys	Other adults	Girls
Kokate	30	47	10	-	13
Abele Sipa	65	11	9	12	3

Source: Tadelle and Ogle, 1996

The financial resources of poor households are often too low to be able to purchase a hen to start their own flocks. However there is a social system to start poultry keeping based on sharing. Poultry sharing is usually arranged between households that have close family or marriage relationships and are in the village. Often this is an inter-household relation between women like sisters or nieces (Aklilu 2007).

Compared to poor women, the better-off households are more often involved in poultry keeping and have more improved chicken breeds and chicken housing. Improved breeds (RIR) are sold to farmers from poultry multiplication stations through the agricultural extension system. Farmers also consider that distance to neighbouring house and involvement in backyard gardening affect a household's decision on the flock size they can

keep. Households in a dense neighbourhood were expected to have less space and keep fewer poultry to prevent conflicts among neighbours. Moreover households accessible to village or regional towns tend to keep larger flock sizes than those in remote areas. (Aklilu, 2007)

3.4.2 Other species

This information has not yet been sourced.

3.5 POULTRY VALUE CHAIN ANALYSIS

Marketing chains for traditional poultry production

In the traditional poultry production sector, women are the primary owners and managers of chickens. Rural women raise poultry for income generation in order to purchase basic commodities such as salt, cooking oil and sugar etc.

The informal marketing of poultry and poultry products at open markets is common throughout the country and both live birds and eggs are sold on road sides. Almost every little shop or kiosk sells table eggs in Ethiopia. Most indigenous birds are sold live and consumers take considerable care to ensure that they are buying healthy birds. Farmers may sell directly to clients at weekly markets or farmers may sell to traders who in turn sell the product to the consumer. Indigenous birds and eggs can be transported over long distances to supply urban markets which results in a deterioration in quality. Both eggs and live birds are transported either on foot or using public transportation along with other bags, sacks of grains, bundles of fire wood etc. The farmers directly sell their chickens to consumers and/or to small retail traders who take them to large urban centres. At all the market areas, chicken buyers are made up of traders, direct consumers, restaurants, farmers and small scale urban chicken keepers. In the primary markets, producers are the predominant sellers, while in the secondary markets both producers and traders sell chickens. In the terminal markets, small traders are the predominant sellers. Small traders operate on a very small scale and the volume of trade ranges from 10-50 chickens. The current terminal market price of adult live bird is about Birr 40-60 depending on the size of the bird and market location.

Despite the benefits of village poultry keeping to poor households in most parts of the country, they face significant market constraints. The distance to the nearest market is a key factor; the nearer the market, the shorter the marketing chain and the higher the price received for both live birds and eggs. It is also clear that increased involvement of intermediaries leads to reduced prices for the producer. A price reduction of 68% for birds and 25% for eggs was observed in areas with poor market access in Tigray Regional State compared to those areas with better market access. Transaction costs may be reduced through improving access to information, infrastructure and organisation of the poultry producers. However, the costs of transport, credit and marketing risks should be carefully assessed (Aklilu, 2007). A further constraint to the marketing of traditional household poultry and products is the fact that there is no packaging and weight standardisation of market eggs and that traditional storage methods can lead to deterioration of the quality of table eggs.

In rural Ethiopia, particularly in the Tigray Regional State, both men and women are involved in the direct selling of poultry. Women make up the majority (40-58%) of the producers who sell at local markets. Men's participation in marketing increases with better market access, and the larger markets in towns are male-dominated. The participation of gender categories in secondary poultry marketing shows a different picture. Men make up the major portion of secondary sellers, particularly in northern Ethiopia. In a market survey conducted at 3 different locations in the Tigray Regional State, it was found that the proportion of women and children in secondary selling was relatively lower than in primary selling. The proportion of men involved in poultry marketing tended to increase with greater market access indicating that men become involved when the benefit becomes larger and access is better. The higher participation of men as intermediaries can be associated with access to financial resources, ability to make risks and access to market information (Aklilu, 2007).

Case Study: Small scale chicken trader

Ayalew Mengesha (25) is unmarried but leads a family of five members (mother, two brothers and a sister). He attended school up to 8th grade but was forced to withdraw to look after his family when his father died. He is a small scale chicken trader. He purchases chicken from rural areas in the vicinity of Jimma town (50 km radius) and sells them in Jimma town. He purchases the chicken at an average price of 20 Birr and sells them for 25 Birr. He transports the chicken on a vehicle and pays 2 birr for 10 chickens. He transports an average of 50 chickens (maximum of 100 and minimum of 20) at a time but could lose 1 or 2 because of various reasons during transportation. There is a high demand for chickens during holydays and lower demand during the main rainy season (June to end of August). He adjusts his business according to the demand in the market. During transportation and in the market he keeps his chicken in locally made containers. The price of one container (capacity of 30 chickens) is around 50 Birr. His chickens sometimes suffer from disease and he treats them with lemon juice regardless of the disease type. He has heard of bird flu through mass media. He fully understands the impact the disease has had on the market. Consumers have abandoned chicken for some time (February to March, 2007). Consequently, he was forced out of the business for a significant period of time. On his part he has taken some precautions advertised through mass media. Ayalew has a total working capital of around 2,000 birr (218 USD) and makes a monthly profit of 200 Birr (22 USD). He claims to be an average trader compared to others (around 15) involved in the same business. He expects the best ones to have a working capital of 5000 birr with a profit of 500 birr and the weaker ones would have 1,000 birr with 100 birr profit per month. Ayalew doesn't like it when prices in the market increase substantially because he has problem of capital to purchase the chicken and many consumers decline to purchase when prices increase. The increase in price, he explains, forced out many out of business. He however feels that this sector is expanding gradually and wants to be part of this expansion. Consumers generally prefer red feathered chickens with black fetching a minimum price (the difference could be as large as 20 birr). Restaurants usually go for cheaper, black chickens.

Marketing chains of breeding and rearing centres

The marketing channel of the breeding and rearing centres consists of the distribution of fertile eggs, baby chicks, pullets/cockerels and culled layers to the rural farming communities at a highly subsidised price. For example, exotic pullets of 3 months of age are sold at Birr 35 from the private commercial poultry farms, whereas exotic pullets of the same age are distributed at Birr 18 from the government-owned poultry breeding and rearing centres, indicating a 50% subsidy. In Ethiopia, the priority is given to women during the distribution of fertile eggs, chicks, pullets/cockerels and culled layers from the breeding and rearing centres.

Marketing from large scale commercial operations

Formal marketing operations exist in the urban and peri-urban areas where large scale commercial poultry production takes place. The larger commercial poultry units have agreements with clients such as Ethiopian Airlines and the larger hotels to supply poultry meat and eggs. Most poultry meat is sold frozen. The majority of the products sold within the formal sector come from the commercial industry but a small number of frozen indigenous chickens are supplied through supermarkets in Addis Ababa. Dressed poultry carcasses and table eggs are sold to residents and hotels either in supermarkets or small shops/kiosks. Most of the supply of dressed poultry carcasses to Addis Ababa supermarkets comes from the Alema poultry farm, but many unidentified sources also supply the supermarkets.

3.5.1 Day-old chicks

This information has not yet been sourced.

3.5.2 Chicken meat

This information has not yet been sourced.

3.5.3 Table eggs

This information has not yet been sourced.

3.5.4 Other species

This information has not yet been sourced.

Chapter 4

Trade, marketing and markets

4.1 DOMESTIC MARKET

The price of live birds varies depending on sex, colour, size and market location and the demand for both eggs and live birds is subject to seasonal variations. According to Hoyle (1992) and Kenea et al (2003), late May to early June is the opening period of the “rainy season” which coincides with outbreaks of poultry disease, with farmers selling all or almost all their flocks in the SNNP Regional State and in Eastern Shewa Zone of the Oromia Regional State. In most parts of the country, prices fall to their lowest annual level until the end of August. Prices rise for the Ethiopian New Year (September 11) and for Meskel feast (September 27). The feast which occurs in December and April also leads to price rises.

In summary, the largest off-take rates from flocks occur particularly during holidays and festivals and during the onset of disease outbreaks. The latter is a measure to prevent or minimise expected financial losses from high morbidity and mortality. In such circumstances, prices fall dramatically since supply is higher than demand. According to Aklilu (2007) in northern Ethiopia (particularly in Tigray) most strict Orthodox Christians households – especially in rural areas – abstain from eating animal products during the Easter fasting period, pre-Christmas fasting period and on Wednesday and Fridays. There are fluctuations across the months of the year in sales as well as in consumption of both birds and eggs. The highest bird sales and consumption overlap with the major social and religious festivals of the year. These are Ethiopian New Year (September), Ethiopian Christmas (January), Ethiopian Epiphany (January), Ethiopian Easter (April) and St. Mary’s day (August). The periods of low bird sales and consumption coincide with the pre-Easter fasting period which lasts about two months from February through March. The other low sales and consumption period is during the pre-Christmas fasting period.

Table 6: Distribution of markets

This information has not yet been sourced.

4.2 IMPORT

This information has not yet been sourced.

4.3 EXPORT

The export market for poultry products is very limited due to international competition, especially from frozen Brazilian broilers that are sold at very low prices. It may be worthwhile studying consumer preferences in neighbouring countries to determine if niche markets exist for extensively raised indigenous birds and their eggs.

4.4 SLAUGHTERING FACILITIES

This information has not yet been sourced.

4.5 POULTRY FEEDS

Indigenous poultry feeding

There is no planned feeding of chickens under traditional village production in Ethiopia and scavenging is almost the only source of diet. The scavenging feed resource base for local birds is inadequate and variable depending on season (Hoyle 1992 and Yami and Dessie, 1997). The amount of feed available for scavenging in relation to the carrying capacity of the land areas and flock dynamics across the different seasons and agro-ecologies is still not

adequately quantified. However, studies conducted in three villages of the highlands with different altitudes and in three seasons revealed that the materials present in the crop, as visually observed, are seeds, plant materials, worms, insects and unidentified materials (Dessie and Ogle, 2000). According to the same report, during the short rainy season (March to May) the percentage of seeds in the crop contents is higher at all the three study sites, probably because of the increased availability of cereal grains which had just been harvested. These are given to the birds in larger amounts than during the big rainy season and dry season of the year. Another factor is that relative amounts of available plant materials are lower during the short rainy season. The mean percentage of plant materials in the crop contents is highest during the rainy season (June to September) as a result of the increased availability of plant materials and the relative scarcity of seeds during this season might increase intake of plant materials. The largest proportions of worms in the crop contents were found during October to February at a higher altitude which might be attributed to the relatively high and extended rainfall. A larger proportion of insects were also found during the short rainy seasons. The nutritional status of local laying hens from the chemical analysis of crop contents indicated that crude protein was below the requirements for optimum egg production. Protein supply may be critical, particularly during the drier months, whereas energy may be more critical during the rainy season, (Yami and Dessie, 1997).

There may be deliberate supplementary grain feeding during the ripening and harvesting period (October-March). The quantities of supplementation gradually decrease until June-August, during which scavenging is the only source of their feed. Scavenging chickens are vulnerable to predation as they need to leave the family dwelling to scavenge for feed. Scavenging for food away from the family dwelling also results in birds coming into contact with larger numbers of birds from other flocks, facilitating the spread of infection. Newcastle disease is usually cited as the most widespread, particularly during the rainy season.

Commercial Feeds

Processed poultry feed consisting mainly of cereal grains, cereal grain by-products and oilseed cakes are available from feed mills that are largely concentrated in and around the capital, Addis Ababa. None of the feed mills have pelleting facilities. This is a serious shortcoming especially for efficient broiler production.

The quality of mixed feed used is generally poor (Yami and Dessie, 1997). Most formulations available do not have vitamin/mineral premixes. Ingredients and processed feeds vary in nutritive value and there is no regular quality control mechanism in the country. The lack of feed quality legislation and laboratory facilities for chemical analysis also contributes greatly to the poor quality of processed feeds. The price of raw materials varies according to source of supply, region and season. However, the prices of formula feeds doubled in the last 5 years, which does not relate to the costs of the raw materials. Transport costs add significantly to the cost of feed in areas distant from the sources of supply. The lack of regional feed mills and dependence on supplies of some ingredients from large cities add to the overall cost of feed in many parts of the country. The absence of bulk deliveries and storage facilities increases feed costs and in some cases wastage occurs due to weevil infestation. The shortfall in the supply of protein sources (e.g. soybean) following the ban imposed on using protein sources of animal origin made the prices of formula feeds extremely high. In many instances, the cost of mixed feed does not seem to follow reductions in ingredient cost. Prices of mixed feed remains unduly high (Birr 190/ 100 kg), even at times when the price of the major component of mixed rations (e.g. corn) fall by more than 50%.

**TABLE 8:
Feed milling capacity in and around Addis Ababa**

Mill	Capacity	Location
Kality feed plant	8	Kality
Akaki " "	2	Akaki
Ex-soldiers	1	Debre Zeit
Zenata	1	Debre Zeit
Bora	1	Debre Zeit
DZARC	1	Debre Zeit
FVM	1	Debre Zeit
Almaz	1	Debre Zeit
Getachew/ Assefa	2	Debre Zeit
DDA	1	Debre Zeit
Sululta (Mekonnen)	1	Sululta
Ginchi feed mill	1	Ginchi

Source: Alemu Yami 1997

Chapter 5

Breeds

5.1 EXOTIC BREEDS

In Ethiopia, the importation of exotic breeds of chicken goes back to the early 1950s. According to Alamargot (1987), about 99% of the Ethiopian poultry population consists of indigenous chickens, while the remaining 1% consists of imported exotic breeds of chickens during the 1970s and 1980s. There has been an increase in the number of exotic breeds of chickens and at present it is estimated that these make up about 2.18% of the national poultry population (CSA, 2004-2005). These figures show that the share of exotic chickens in the total annual egg and poultry meat production has increased by 118% over the last 20 years. Unfortunately however, the contribution of exotic poultry to the Ethiopian economy is significantly lower than that of other African countries (Table 9)

TABLE 9:
Percentage contribution of exotic breeds of chicken in selected African countries to the total poultry population

Country	Contribution (%)	Source
Cameroon	35.0	Agbede et al (1990)
Ethiopia	2.0	CSA(2004-2005)
Gambia	10.0	Andrews (1990)
Kenya	20.0	Mbugua(1990)
Malawi	10.0	Upindi(1990)
Nigeria	9.0	Adene(1990)
Zimbabwe	70.0	Kulube(1990)

Source: Alemu Yami and Tadelle Dessie, 1997

All the available evidence indicates that all the imported breeds of chickens performed well under the intensive management system (Yami and Dessie, 1997). Some productivity measures of the indigenous chickens, the breeding and multiplication centres and the commercial poultry farms located in and around the vicinity of Debre Zeit are shown in Table 10.

TABLE 10:
Comparative productivity indicators of the traditional, breeding centres and commercial poultry production systems in Ethiopia

Item	Traditional (indigenous)	Breeding centres	Commercial farms
Average egg weight(g)	38	56	56
Mean laying period/ hen(days)	20	>200	>200
Eggs/hen per year	60	200	230
Natural incubation period (days)	21	NA	NA
Natural brooding period (days)	56	NA	NA
Mean total days of out of laying	96	NA	NA
Chick mortality (%)	40	5-10	5-6
Fertility (%)	75	80	90
Hatchability (%)	70	65	80
Age at first egg (days)	180	150	145
Slaughter weight at 12 months	1.5	NA	NA
Mortality of adult flock (%)	20-30	6-8	5-6
Mortality of broilers (%)	NA	NA	10-15
Slaughter weight at 8 weeks(kg)	1.5	NA	1.8
Adult weight (kg)		NA	NA

Source: CACC 2003 and Alemu Yami 1997

5.2 LOCAL BREEDS

The Ethiopian indigenous chickens are non descriptive breeds closely related to the Jungle fowl. They vary in colour, comb type, body conformation and weight and may or may not possess shank feathers. Broodiness (maternal instinct) is pronounced. They are characterized by slow growth, late maturity and low production performance. The mean annual egg production of indigenous chickens is estimated at 60 small eggs with thick shells and a deep yellow yolk colour (Yami and Dessie, 1997). The egg laying period and number of eggs laid per period are to some extent higher in urban than in rural areas (CACC 2003). The carcass weight of local chickens at 6 months of age was 559 g which was significantly lower than that of the 875 g found for Leghorn but higher in dressing percentage than exotic chickens (Teketel, 1986).

The productivity of local scavenging hens is low, not only because of low egg production potential, but also due to high chick mortality. About 40-60% of the chicks hatched die during the first 8 weeks of life (Hoyle, 1992, Dessie 1996 and CACC, 2003) mainly due to disease and predation. About half of the eggs produced have to be hatched to replace chickens that have died (Dessie 1996), and the brooding time of the laying bird is longer, with many brooding cycles required in order to compensate for unsuccessful brooding. It is estimated that under scavenging conditions, the reproductive cycle consists of 20-day lying phase, 21-day incubation phase and finally a 56-day brooding phase (Yami and Dessie, 1997). This implies that the number of clutches per hen per year is probably 2-3. Assuming 3 clutches per hen per year, the hen would have to stay for about 168 days out of production every year, entirely engaged in brooding activities.

The low productivity of indigenous stock can also partially be attributed to the low management standard of the traditional production system. It has been observed that the provision of vaccination, improved feeding, clean water and night time enclosure improves the production performance of indigenous chickens, but not to an economically acceptable level (Hassen 1992; Burley, 1957 and Teketel, 1986)

Local chickens are considered to be disease resistant and adapted to their scavenging environmental conditions. Unfortunately however, local chickens kept under the intensive system of management (in confinement) are inferior to exotic stock in health status and characterised by a lack of interest in their environment, wing droppings, huddling at the corner, leg weakness and cannibalism. They are also slow in rate of feathering and exhibit recurrent outbreaks of disease (Demeke 2004). The percentage mortality from hatching to maturity was significantly higher for local chickens kept under an intensive management system (24%) compared to the Leghorns (7.3%) kept under similar condition. Higher mortalities and morbidities have been reported among local birds than White Leghorns when raised under intensive management conditions in Awassa (Teketel, 1986), Debre Zeit (Abebe, 1987), Arsi (Brannang and Persson, 1990) and Alemaya (Abebe 1992).

The reason for the high mortality of local birds under the intensive management system is not clear, but it could be due to the fact that they are not used to confinement. Diseases which are significant under confinement, such as coccidiosis, may have a greater effect in local stock than in exotic stock (Yami and Dessie 1997). The general indication is that this condition calls for a scientific study and explanation. At present, it could safely be said that local chickens are appropriate under the traditional production system with low input levels that makes the best use of locally available resources.

Chapter 6

Veterinary health, public health, biosecurity measures

6.1 HIGHLY PATHOGENIC AVIAN INFLUENZA

The outbreak of HPAI in many African countries (Nigeria, Niger, Cameroon, Egypt, Burkina Faso and Sudan) and the occurrence of high chicken mortality in Ethiopia resulted in an increased perceived risk of HPAI entry to Ethiopia either by wild bird migration (originally considered as the main risk) or by movement of infected birds or contaminated products or materials from other countries. The perceived risk seemed to be significant as poultry keeping occupies an important place in Ethiopia and there is significant contact between producers/consumers and birds in certain contexts.

The first suspected outbreak of HPAI occurred on a farm at Gubre, approximately 150 km south-west of Addis Ababa and was reported on 25 February 2006. The outbreak was investigated, samples collected and some testing undertaken at the National Animal Health Research Center (NAHRC) at Sebeta. Subsequently, two consignments of samples were sent to an OIE/FAO Avian Influenza Reference Laboratory at Padova, Italy. The affected flock (about 15,000 birds) was culled. To date, it has not been possible to establish definitely whether the outbreak was or was not HPAI (Yilma, 2007).

Following this incident, FAO initiated a project (OSRO/ETH/601MUL), aimed at urgent intervention for the early detection, prevention, and control of Avian Influenza in Ethiopia and to provide considerable and extensive support in the development and finalization of the three year national avian and human influenza strategic preparedness and response plan. It also assisted in conducting national/regional training courses in communication methodology aimed at raising awareness amongst different stakeholders.

Ethiopia along with other East Africa Rift Valley nations like Kenya, Tanzania, and Uganda are considered at high risk for the spread of the virus as millions of birds migrate during the European winter to this region. The MoARD, in collaboration with other government and non-governmental institutions, has been formulating a strategy that will enable the country to prevent the possible occurrence of avian influenza. The strategy involved dissemination of information through mass media, pamphlet, posters and various meetings. The information disseminated was targeted at both rural and urban areas and covered hygiene, bio-security, the development of a standard marketing system, farm standards, disease diagnosis and confirmation, development of disease surveillance and reporting systems. The World Health Organization has urged all African countries to take measures to protect human health against bird flu and to prepare for a pandemic.

The traditional Ethiopian way of preparing chicken 'Doro wot' is very expensive due to various ingredients involved in the preparation. Therefore, many families normally consume chicken during the holy days. However, because of the fear of bird flu, it was observed that people completely abandoned chicken during the months of February and March 2006. This fear caused major damage to the poultry industry in the country at large. The severity of the effect varied with the sector involved, with intensive commercial production enterprises most severely affected. The fear in some areas pushed small scale traders of chicken out of the business for a significant time span. Fortunately, because of sound information transfer through the mass media and the laboratory confirmation of the fact that the suspect disease was not HPAI, consumers soon returned to consuming chicken and chicken products.

Impact on the Commercial Sector

The demand for broilers was almost non-existent from February 2006 due to the fear of HPAI, but egg sales did not suffer greatly. Following February 2006, storage facilities for frozen birds were full and large numbers of birds (as high as 20,000 kg/farm) had been slaughtered and buried over two weeks in Debre Zeit. Poultry farmers blamed the Ministry of

Health for disseminating confusing information about the bird flu threat which they claim caused a loss of millions of birr around the Easter festivities. According to the Poultry Farmers' Association, the ministry disseminated terrifying information to the public about the flu threat.

Impact on Chicken Traders

In urban areas, consumers have a preference for indigenous chickens purchased alive that can then be slaughtered at the consumer's home immediately prior to preparation. Consumers often pick up the birds to check their weight and to examine their health. The major problem mentioned by traders was the sharp downturn in sales due to the public fear of HPAI. A very comprehensive public awareness campaign about the dangers of HPAI was initiated in February 2006 following high mortality in a government poultry unit. Almost all traders reported that the number of chickens being sold decreased dramatically and the sale price of birds dropped from around ETB 30-35 to ETB 18-22 per bird. They all reported to have lost thousands of Birr following the campaign in the market places of Addis Ababa.

Impact on the Traditional Sector

About 99% of the annual poultry meat and egg production comes from the indigenous chickens kept under the traditional management system. Some of the recent data also indicates that 97.82% of the Ethiopian poultry population comprises of the indigenous chickens. The current per capita egg and poultry meat consumption is extremely low, since poultry products are of less importance to the Ethiopian rural household diet than other food items. Thus in rural Ethiopia, the emergence of HPAI is unlikely to lead to food insecurity on its own.

6.2 OTHER MAJOR POULTRY DISEASES

For regularly updated information on the status of notifiable and other transboundary poultry diseases, please refer to:

The FAO Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases available at www.fao.org/ag/againfo/programmes/en/empres/home.asp

The OIE World Animal Health Information Database (WAHID) available at www.oie.int

Newcastle disease (ND) is the main cause of economic loss in poultry production in this country (Nasser et al., 2000). The National Veterinary Institute (NVI) produces a range of ND vaccines (HB1, La Sota and I-2 strains) and provides them on request to large and small scale commercial producers. The ND vaccine instruction sheets prepared by NVI provide guidelines suitable for commercial flocks (which appear to be vaccinated regularly), but do not provide information tailored for the use of the vaccine in rural areas; vaccination against ND occurs in rural areas only in response to an outbreak. There is no national ND control policy or coordinated prevention and control program.

For the veterinary Services, Newcastle Disease outbreaks are largely under-reported (Table 11).

TABLE 11:
Reports of nd outbreaks to the veterinary services during the period 2000 to 2004

Year	No of outbreaks	No of cases	No of deaths	No destroyed	No slaughtered	No vaccinated
2000	8	507	282	0	0	0
2001	34	15,094	9,625	0	54	24,999
2002	67	2,265	863	0	6,516	22,047
2003	16	1,084	347	0	20	2,779
2004	40	2,714	953	0	1	29,958
Total	165	21664	12070	0	6591	79783

Source: Ministry of Agriculture, 2005

According to CACC (2003), the estimated number of vaccinated and treated animals in the country in the agricultural year of 2003 was estimated at 11.5 and 2.8 million respectively of which 1.39% and 10% was poultry respectively. On the other hand the great majority of afflicted (56%) and dead (67%) animals were poultry. Data on the number of poultry vaccinated, treated, afflicted and died during the agricultural year of 2003 are given in Table 8. However, information pertaining to specific diseases is not given. At the beginning of the agricultural year of 2003, the total chicken population was estimated to be 42,915,628 of which 0.37, 0.68, 26.4 and 24.2% was vaccinated, treated, afflicted and died respectively at the national level. The number of poultry which died over the year at the national level was estimated at 10.2 million (24% of the national poultry population) resulting in the poultry population of 32,514,132 at the beginning of 2004.

The four major Regional States (Oromia, Amhara, SNNP and Tigray) collectively account for about 94% of each of the national chicken population vaccinated, treated, afflicted and died over the year. Oromia Regional State reported about 44% of each of the national chicken population vaccinated, treated, afflicted and died over the year. On the other hand, SNNP Regional state lost about 33% of its regional chicken population to diseases over the period of one year, followed by Oromia which lost 30% of its chicken population over the same period due to disease. Among the four major Regional States, mortality during the year specified was lower for Tigray Regional State (8.3%) as measured as a percentage of the regional chicken population lost to disease over the year. The death rates registered from Afar, Benishangul, Addis Ababa, SNNP and Gambella Regional States were higher than that of the national average for the year 2003, whereas the greatest mortality was recorded from SNNP Regional State.

TABLE 12:
Number of poultry vaccinated, afflicted, treated and died by region (2003)

Geographic areas	Vaccinated (%)	Afflicted (%)	Treated (%)	Died (%)
Ethiopia	0.37	26.4	0.68	24.2
Tigray	15.0	4.03	4.7	4.0
Afar	NA	0.27	0.02	0.28
Amhara	33.0	21.9	22.5	22.1
Oromia	33.0	41.8	47.0	42.0
Somali	NA	0.14	NA	0.13
Benishangul	4.0	4.4	4.7	4.2
S.N.N.P.R	12.9	26.2	20.2	25.9
GAMBELLA	NA	0.69	0.3	0.68
Harari	NA	0.06	NA	0.06
Addis Ababa	NA	0.38	0.4	0.39
Dire Dawa	NA	0,03	NA	0.02

Source: CACC, 2003

The small scale modern poultry farms located in Debre Zeit and Addis Ababa enjoy the privilege of being advised and assisted by health professionals and the Faculty of Veterinary Medicine. They are also able to access information, vaccination and treatment drugs. The small scale modern poultry production systems located outwith these locations have limited access to such service.

Prior to February 2006, the health measures at the government owned poultry multiplication and distribution centres were extremely poor. The basic bio-security and hygienic practices are often disregarded and husbandry know-how is generally lacking. Foot-bath application, if practised at all, was only when people enter the poultry houses but not when they leave poultry houses. With the exception of Bonga and Bedelle, all the centres were devastated by the outbreak of Infectious Bursal Disease i.e. Gumboro disease (Yilma Jobre, 2007 and Personal Communication with the managers of Beddelle, Bonga, Kombolisha and Andessa Poultry breeding centres). Infectious Bursal Disease (IBD) has become a problem during the past few years and it is assumed that it was introduced to the country through the importation of infected poultry, poultry products or poultry equipment. IBD is a disease of economic importance, especially to the government operated breeding and rearing centres and commercial poultry sector. The breeding and rearing centres and the commercial

farms in Ethiopia vaccinate against IBD (Table 13). The Newcastle Lasota is repeated every three months after 2 months of vaccination.

TABLE 13:
Vaccination program of the breeding and rearing centres (Bonga)

Age	Disease	Strain	Revaccination
7th day	Newcastle	HBI	yes
14th day	Infectious bursa	Gumbro	yes
21st day	Newcastle	Lasota	yes
28th day	Infectious bursa	Gumbro	yes
42nd day	Fowl typhoid	S.gallinarium	yes
60th day	Newcastle	Lasota	yes
84th day	Fowl typhoid	S.gallinarium	yes
5 month	New castle	lasota	yes

Source: Bonga Breeding Centre, 2007

6.3 BIOSECURITY MEASURES

Backyard Poultry Production

The bio-security of the backyard poultry production system is very poor, as scavenging birds live together with people and other species of livestock. Poultry movement and droppings are very difficult to control and chickens freely roam in the household compound. There is no practice (or even viable means) of isolating sick birds from the household flocks and dead birds are left for either domestic or wild predators. Chickens and eggs are sold on open markets along with other food items. The current live bird marketing system represents a significant and potential hazard to both buyers and sellers, yet implementation of bio-security and hygienic practices in such a system is generally difficult. The Newcastle Disease experience and the attitude of communities to handling sick birds (which are often sold) shows that marketing systems play a considerable role in the dissemination of disease over wide geographical areas in a relatively short period of time (Gebreab, 1995). The first recorded case of Newcastle disease was in 1970 on a poultry farm near Asmara, Eritrea, from where it spread all over Ethiopia within a short period of time. In summary, it is very difficult to apply health and bio-security measures on full day scavenging birds in small flock sizes.

Breeding centres

Successful attempts aimed at the rehabilitation of these centres have been made in recent years along with significant improvements in bio-security. Some of these improvements include strict sanitary measures, regular vaccinations, disinfections, controlled movement of the flock and employees, strengthened sanitary facilities (eg foot bath, incinerators, fumigations), the cleaning of wild bird nests, and close observation/chasing of wild birds. Currently the mortality of the baby chicks is reported to be very low except in the case of Mekele, where the rate of mortality of the imported RIR baby chicks is relatively higher. The lack of a feed processing plant and surveillance/diagnosis facilities at the Mekele centre and the dependence on Debre Zeit for mixed feed supply further complicates the situation. Imported chick mortality is the lowest at Kombolisha centre.

Commercial Production

The bio-security status in many of the intensive poultry farms (Sector 3) is extremely poor (Wossen, 2006). The management and health care practices are generally inadequate to ensure the introduction of HPAI is prevented and to control the disease should an outbreak occur. The sale of poultry waste for animal feed, exchange of sacks and the lack of bio-security and hygienic measures at feed processing plants, inadequate bird slaughtering and packaging facilities in many commercial poultry facilities, and the sourcing, handling and storage of poultry products in supermarkets are some of the bio-security issues that require urgent consideration and policy decisions.

According to Wossene (2006), day old chickens are imported from countries like Egypt, UK, Germany, Kenya and Holland as a parent stock by ELFORA, Genesis Farms and Alema farm. Information obtained from the federal MoARD indicates that the OIE recommendations are followed during importation of birds into the country. Critics of the importation regulations indicate that although certifications that testify freedom from major diseases are used as criteria for importation, follow up quarantine and inspection activities are not in place either at the Federal or at the importing farm level. A case in point is the absence of any follow up at Almaz poultry farm which imported 5000 day old parent stock from Egypt, just five days before the importation ban was issued from countries like Egypt. At the beginning of 2006, the Federal Ministry of Agriculture has issued a circular that forbade importation of live birds and poultry products from infected countries such as Egypt, UK and Germany in connection with HPAI. Recently a second circular was issued that allows the importation of poultry products from any country irrespective of their HPAI status as long as they meet the OIE recommendations. In the absence of effective veterinary services and verification mechanisms, such provisions could pose a potential treat to Ethiopian poultry production.

Chapter 7

Current policies, legal framework

The Government of the Federal Democratic Republic of Ethiopia prepared a detailed and comprehensive poultry bio-security policy as part of the three-year (2006-2009) National Strategic Preparedness and Response plan for the avian human influenza pandemic threat. The policy mainly addresses bio-security and hygiene measures to be practised on commercial farms and poultry breeding and dissemination centres as well in backyard production systems. A "Poultry Bio-security Task Force (PBTF)" was also proposed to enforce the bio-security policy and evaluate the process, particularly on commercial farms and breeding centres.

In order to prepare the country for possible incursions of highly pathogenic avian influenza (HPAI), in March 2006 FAO-Ethiopia initiated a project entitled "Urgent intervention for the early detection, prevention and control of avian influenza in Ethiopia (OSRO/ETH/601/MUL)". This project had financial assistance from the British government under DFID and the United States USAID. The project's main objectives were to step up the surveillance and diagnostic capacity and to respond quickly to outbreaks through containment. In line with this, the national Coordination and Technical Committee was established from both the livestock and human health sector and various policies, manuals and strategic documents were produced.

Additionally, the government has played an active role in the promotion of poultry production to support of poverty alleviation and food security initiatives. It is currently understood that the role of government is to establish a facilitating legislative environment to support the efficient functioning of the private poultry sector. The government is also responsible for the formulation and supervision of disease control legislation and policies in accordance with OIE guidelines. Animal health legislation has been drafted but has not yet been approved and the government is yet to define a poultry breeding policy. In addition to the above, the additional roles expected from the government include infrastructure development, support of the establishment of breeding stock farms, developing a poultry breeding strategy, developing regulations and legislations on quality of inputs and standards for poultry and poultry product marketing.

Chapter 8

Analysis

8.1 CURRENT STRENGTHS AND WEAKNESSES OF THE POULTRY SECTOR

- The productivity of scavenging hens is low not only because of low egg production potential. It is also due to a long reproductive cycle (attributed to natural incubation and brooding) and high chick mortality caused by disease condition and predations. Increased health measures and the use of appropriate technologies (such as hay-boxes) should be introduced.
- The private commercial poultry sector operates using advanced technology and specialised genetic materials and plays a key role in the urban and peri-urban economy. But the 10.5 million households involved in small scale agricultural production receive limited support. Government poultry breeding and rearing centres need to be strengthened to address this lack of support.
- There is a range of NGOs and institutions involved in the implementation of poultry development projects in support of vulnerable households. There is a need to develop guidelines to coordinate all available efforts in the area of rural poultry production.
- The large-scale private commercial poultry operations and the government poultry breeding and rearing centres involved in the importation of eggs, baby chicks and other facilities pose a potential risk of disease entry to the country. The government needs to define a poultry breeding and importation policy and develop legislation on the quality of inputs and standards for poultry and poultry product marketing.
- There are serious biosecurity risks relating to the traditional poultry production system. Awareness creation and the promotion of amended practices should be a priority.
- The fact that a significant proportion of small-scale commercial poultry operations in major cities and towns are not officially registered and are located in urban centres in highly populated residential areas highlights the need for action.

8.2 PROSPECTS OF THE POULTRY SECTOR OVER THE NEXT FIVE YEARS

This section has not been developed yet.

Annex I

Who is who (contact list)

This information has not yet been sourced.

Annex II

List of major projects – poultry sector

Government support

At present MoARD is the organisation mandated with poultry extension work. A poultry expert is a member of the animal breeding and feed resource and fisheries development team at both the national and regional MoARD. The Ministry poultry extension activities thus far have concentrated on breed improvement through distribution of exotic breeds. The Ministry currently has 14 poultry breeding and/or rearing centres and four additional rearing centres (satellite brooder houses) are planned for Amhara Regional State (2007). The objectives of these multiplication centres include the distribution of fertile eggs, baby chicks and pullets and cockerels of improved breeds, provisions of in-service training to farmers and extension workers and serving as a model farms.

The ongoing national poultry extension package of the Ministry (2007) comprises of the distribution of 3 month old exotic pullets and cockerels. However, the supply of improved pullets and cockerels from the government poultry multiplication centres has not been commensurate with demand. The breeding multiplication centres are expected to rear chicks up to three months of age or even older before distribution to farmers, but are unable to meet demand due to the huge requirement in terms of brooding facilities, despite having adequate hatching capacity.

The ministry promoted a scheme whereby cockerels and pullets of Rhode Island Red (RIR) were distributed from the breeding and multiplication centres to subsistence farmers. It has been reported that this breed has already acclimatised well to the existing production environment and gives a reasonable production under smallholder management systems. Despite this, there is a serious complaint about the poor hatchability of their eggs under natural incubation. This is a very critical issue for sustainability and the multiplication of the breed in the farming system. The information obtained from the Amhara Rural Development Bureau of Agriculture relating to RIR breeding performance indicated that the farming community is facing problems as a result of poor fertility and hatchability. The reasons for the low hatchability of RIR are not known (Shiferaw et al, 2006).

NGOs and other institutions

A small number of NGOs and FAO are involved in the implementation of poultry development projects to support vulnerable households. FAO, in collaboration with Ambo College of Jimma University launched a project (TCP/ETH/3003(T)) to train disabled people on household poultry (among others), providing start up kits comprising chicks and pullets/cockerels of exotic breeds. FAO also provided considerable and extensive support in the development and finalisation of the three year national avian and human Influenza strategic preparedness and response plan. It also assisted the implementation of national/regional training courses to raise awareness on avian and human Influenza (Jobre, 2007). UNHCR has distributed chicks and pullets/cockerels of exotic breeds to refugees in southwestern Ethiopia. (Personal communication with the distributing bodies as consultant on poultry).

In 1996, training on household poultry accompanied by the distribution of chicks and pullets/cockerels was carried out by Winrock International (WI) at Ginbo, Bonga in the SNNP Regional State. Donors and NGOs involved in training on household poultry and hay-box chick brooding technology and distribution of chicks of exotic breeds include CIDA (in collaboration with JUCAVM and NSAC), GTZ and FCE (Facilitator of Change in Ethiopia). Many NGOs which operate under the umbrella of the Christian Relief and Development Agency (CRDA) are involved in training and chicken distribution and helped the avian flu prevention effort by mainstreaming avian Influenza into their program.

Smallholder poultry production has been a frequent sub-component of a number of donor-funded projects, for example the credit project of the International Fund for Agricultural Development (IFAD) targeting poorer rural women (Nabeta, 1997). The most common type of support provided has been credit for small-scale poultry enterprises. Frequently, the IFAD

project also included other support activities, such as the strengthening of animal health services, the training of beneficiaries in health and husbandry practice and on- and off-farm adaptive research on topics related to poultry production (Aklilu, 2007). In Ethiopia, the Australian V4 feed supplied vaccine for Newcastle Disease was tried on-station and on-farm through the FAO Rural Poultry Project by the National Veterinary Institute (NVI) with promising results. The development of the new heat tolerant vaccine that can be administered via feed opened up the possibility of significantly reducing mortality in village poultry, which should make producers more positive towards genetically improved birds and inputs to improve feeding and housing (Yami and Dessie 1997).

In comparison with government agricultural offices, NGOs often have more and better equipped field staff who can work together with communities. Theoretically any project should be implemented in collaboration with the relevant government agencies but in practice this rarely occurs. There is no legislation relating to NGOs and so it is currently difficult to achieve optimal coordination between NGOs and government. Above all, NGOs need to work in line with government's poultry development plan and need to be part of the national development system.

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Annex IV

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From 1953 to 1965, results of poultry research were published as experiment station bulletins, annual and progress reports and miscellaneous publications by the academic staff of College of Agriculture. Ethiopia institutionalised agricultural research and extension with the establishment of the Institute of Agricultural Research (IAR) and other regional development projects starting from 1966. However, IAR did not take up poultry research as one of its research programs. Poultry research thus far has therefore been undertaken only by institutions of higher learning and the publications produced from 1966 to 1996 consists of Thesis works, Proceedings and Journal articles produced by academic staff of agricultural education institutions, staff of regional development projects and international organizations including FAO. Established in 1997, Ethiopian Agricultural Research Organization (EARO), recognized poultry as one of the commodity research programmes. The comprehensive bibliography on poultry includes the following:

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Annex IV

Maps

No maps available