

Chicken Meat Production, Consumption and Constraints in Ethiopia

Matawork Milkias
The Jimma University College of Agriculture and Veterinary

Abstract

This paper reviews the production, consumption and constraints of poultry in Ethiopia to deliver summarized and synthesized information for the beneficiaries and readers. Of all domestic animals in the Ethiopia poultry is the most numerous, all of which are represented exclusively by chickens because the others are living in their natural habitats. In Ethiopia, Poultry (chicken) production plays a significant role in the supply of human food (eggs and meat) in rural and urban area and as a source of income, especially to small holder farmers. About 95.86% of the total national poultry products (eggs and meat) are contributed by indigenous chickens kept under village management system while the remaining 1.35% is obtained from intensively kept exotic breed of chickens and 2.79% are obtained from hybrids. The poultry sector in Ethiopia can be characterized into three major production systems based on some selected parameters such as breed, flock size, housing, feeding, health, technology and bio-security. These are large scale commercial poultry production system, small-scale commercial poultry production system and village or backyard poultry production system. They all have their own roll for the national production and consumption. Poultry products offer affordable quality animal protein sources for the smallholder farm households. Poultry consumption is moreover closely associated with wealth status. Chickens are consumed mostly during holidays. In general, poultry consumption accounts for less than 1% of the total annual food needs of farm households. Under poultry production prevailing disease, predators, nutrition, poor housing, weak agricultural extension service, low income level, religion and gender are major constraints to poultry production and its meat consumption in Ethiopia. Therefore to increase poultry production and meat consumption domestication of other poultry species, giving special emphasize on exotic poultry production, and solving of all the constraints are better.

Keywords: Production, Chicken meat, Consumption, Constraints, Ethiopia.

1. INTRODUCTION

1.1 Background

Agricultural production dominates the Ethiopian economy and contributes 45% of gross domestic product (GDP) and provides more than 80% of employment. The major source of foreign exchange is coffee, which provides 65% of export earnings. Other agricultural export products are oilseeds, pulses, cotton, sugar cane, flowers, hides and skins and livestock - mainly sheep and cattle. Ethiopia has the highest livestock populations in Africa and accounts for 17% of cattle, 20% of sheep, 13% of goats and 55% of equines in sub-Saharan Africa. In fact, Ethiopia is the first in Africa and tenth in the world in livestock populations. Livestock contributes 16% of GDP. Seventy per cent of cattle, 75% of sheep, 27% of goats and 80% of equines are found in the highlands. Of all domestic animals in the country poultry is the most numerous, all of which are represented exclusively by chickens (Tangka et al. 2002).

The global poultry population has been estimated to be about 16.2 billion, with 71.6 % in developing countries, producing 6.7million metric tons of chicken meat and 5.8 million metric tons of hen eggs (Gueye, 2005). In Africa, village poultry contributes over 70% of poultry products and 20% of animal protein intake (Kitalyi, 1998). In East Africa over 80% of human population live in rural areas and over 75% of these households keep indigenous chickens, the remaining keeps exotic and hybrids. The Ethiopian poultry population (chicken) is estimated to be about 56.87 million (CSA, 2014).

Poultry contribute important socio-economic roles for food securities, generating additional cash incomes and religious/cultural reasons (Salam, K., 2005). Poultry is the largest livestock species worldwide (Jens Christian et al., 2004), accounting for more than 30% of all animal protein consumption (Gueye, E.F., 1998). In Ethiopia, Poultry (chicken) production plays a significant role in the supply of human food (eggs and meat) in rural and urban area and as a source of income, especially to small holder farmers (Alemuet al.2009).

In Ethiopia, about 95.86% of the total national poultry products (eggs and meat) are contributed by indigenous chickens kept under village management system while the remaining 1.35% is obtained from intensively kept exotic breed of chickens and 2.79% are obtained from hybrids(CSA,2014).

Poultry products offer affordable quality animal protein sources for the smallholder farm households. Rural households consume a very limited quantity of poultry products. They rank cash income as the primary purpose of village chicken production. Poultry consumption is moreover closely associated with wealth status. The poorer the household, the fewer poultry products are eaten. Chickens are not a daily food even for a better-off household. Chickens are consumed mostly during holidays. In general, poultry consumption accounts

for less than 1% of the total annual food needs of farm households (Bush, 2006).

There are a number of challenges and obstacles (constraints) limiting the success and profitability of chickens kept under both traditional and modern production system in Ethiopia. Therefore, a comprehensive literature review on the chickens meat production, consumption and constraints in the country seems to be appealing.

1.2. Objectives

1.2.1. General objective

The general objective of this term paper is to review the chickens meat production, consumption and constraints in Ethiopia.

1.2.2. Specific objectives

- To review the chicken production systems in Ethiopia
- To review the chicken meat consumption in Ethiopia
- To review the constraints of chicken production systems in Ethiopia

2. LITERATURE REVIEW

2.1. Poultry Production Systems in Ethiopia

Chicken production system is an appropriate and locally available resource in livestock populations. In Africa, Ethiopia is the highest in chicken population (Tadelle et al., 2003b). From sub-Saharan Africa 85% of all households keep chicken under free range/ extensive system, with women owning 70% of it, providing insufficient animal protein in the form of meat and eggs as well as being a reliable source of cash income (Sonaiya, 2004; and Abubakar, 2007).

Only few research results are available on the meat production abilities of local chickens (Tadelle, 2003). Poultry meat and egg production account for more than 28% of the total animal protein produced in world in 1997 (Bogale, 2008). In 2020 the proportional contribution of poultry meat is believed to be increased to 40%, the major increment is being happened in the developing world (Delgado, 1999). In Ethiopia from the total chicken meat production about 99.2% of meat productions are contributed by local chickens with an average annual output of 72,300 metric tons (Tadelle et al, 2003, and Hailemariam, 2006). Day old chickens of different populations of indigenous chicken measures live weight of 27.3g per chicken (Halima, 2007 and Bogale, 2008). Nigussie (2011) in adult live body weight of the different populations of indigenous local chickens also reported 1.6 kg for male and 1.3 kg for females.

According to the result of Bogale (2008) who indicated that the meat production ability of indigenous chicken was limited in growth performance. Local males may reach 1.5 kg live weight at 6 months of age and females about 30% less (Bogale, 2008). In addition, Teketel (1986) reported that the local stocks reached 61 % and 85 % of the body weight of White leghorn (WLH) at 6 months of age maturity. In another study, Abebe (1992) found that the local chicken in Eastern Ethiopia attained 71.5 % of the body weight of WLH at 6 months of age. Solomon (2003) reported that there was no difference between White Leghorn and indigenous chickens raised under scavenging condition in mean daily body weight gain at 2 months of age. He also reported that the indigenous chickens are sold for meat purpose starting from 6-8 months of age at weight of around 0.7-1.4kg. But, the amount and protein contents of chickens' meat fall during dry seasons (Tadelle et al., 2001).

The poultry sector in Ethiopia can be characterized into three major production systems based on some selected parameters such as breed, flock size, housing, feeding, health, technology and bio-security. These are large scale commercial poultry production system, small-scale commercial poultry production system and village or backyard poultry production system (Bush, 2006).

2.1.1. Village or backyard poultry production system

In Ethiopia almost more than 95% of the country's total 43 million poultry population comprises indigenous birds, revealing that the poultry subsector is characterized by traditional small-scale household-level poultry (Dawit et al., 2008 and Halima, 2007). As in other African countries, traditional poultry (Also known as backyard or village-level poultry) in Ethiopia is characterized by having low feed input (Primarily scavenging), low veterinary services and no investment in housing and hence minimal level of bio-security. This system does not involve investments beyond the cost of the foundation stock, a few handfuls of local grains and possibly simple night shades or night time housing in the family dwellings (Dawit et al., 2008). The sources of replacement stocks are usually rough purchasing followed by household hatching and others. In this system birds are usually kept under free-range system and the major proportion of the feed is obtained through scavenging. There are high off-take rates especially during national holidays and occasionally high mortality rates (Moreda et al., 2013 and CSA, 2009).

Village poultry production in Ethiopia represents a significant part of the national economy in general and the rural economy in particular, and contributes 99.2% of the national poultry meat production (AACMC, 1984), with an annual output of 72,300 metric tons of meat (ILCA, 1993).

In general village chickens are kept under free ranging systems, where the main source of their feed is obtained

through scavenging: such as insects, worms, seeds and plant materials, with very small amounts of grain crop and table leftover supplements from the household. The feed content and supplementation, watering, sanitation, health care and housing are the major management problem of backyard poultry production systems (Gueye, 2003).

2.1.2. Small-scale commercial poultry production system

The small scale intensive poultry is newly emerging system in urban and per-urban areas, where either broilers or egg type exotic breeds of chicken 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 Ziet (Meseret, 2010). Most of these farms obtain their feeds and foundation stocks from the large scale commercial poultry farms and involved in the supply of table eggs and broilers to various supermarkets, kiosks and hotels through middlemen (Meseret, 2010 and Nzietchueng, 2008).

The small-scale intensive production system is characterized by medium level of feed, water and veterinary service inputs and minimal to low bio-security (Nzietchueng, 2008). Small scale flock sizes usually ranging from 50 to 500 exotic breeds kept for operating on a more commercial basis are common in the urban and per-urban areas of Addis Ababa (Alemu et al, 2012). Reliable economic data concerning the value of commercial poultry products sold in any one year is not available. The general indications are that they supply meat to urban and per-urban population, particularly to supermarkets, kiosks and hotels. Some of the small scale modern poultry producers, along with Bureau of Agriculture, Cooperatives and DebreZeit Agricultural Research Center distribute breeding seeds and promote improved poultry and feeding technologies (Nzietchueng, 2008).

2.1.3. Large scale commercial farms

The large-scale commercial production system is highly intensive production system involves an average of greater or equal to 10,000 birds kept under indoor conditions with a medium to high bio-security level. This system heavily depends on imported exotic breeds that require intensive inputs such as feed, housing, health, and modern management systems. It is estimated that this sector accounts for nearly 2% of the national poultry population. This system is characterized by higher level of productivity where poultry production is entirely market oriented to meet the large poultry demand in major cities. The existence of somehow better bio-security practices has reduced chick mortality rates to merely 5% (Bush, 2006).

The large scale commercial poultry Provide fertile eggs, table eggs, day old chicks, broiler meat and adult breeding stocks to the small scale modern poultry farms. They are kept as full time business and highly dependent on market for inputs. 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 manager (Getinet, 2007).

There are few private large scale commercial poultry farms, all of which are located in Debre Zeit. ELFORA, Alema and Genesis are the top 3 largest commercial poultry farms with modern production and processing facilities. ELFORA annually delivers (www.ethiomarket.com elfora), around 420,000 chickens and over 34 million eggs to the market of Addis Ababa. Alema poultry farms is the 2nd largest commercial poultry farms in the country delivering nearly half a million broilers to Addis Ababa market each year. The farm has its own broilers parent stock, feed processing plants, hatchery, slaughter houses, cold storage and transportation facilities (Bush, 2006).

According to Getinet (2007) founding most of the supply of poultry products to the Addis Ababa market is in the form of local eggs and chicken sold in several market places and street corners as well as door-to-door by individual traders. Commercial chicken (broilers) and eggs are supplied at farm gates and through the various outlet shops of ELFORA, Alema, Almaz and Tsedey poultry farms; while commercially organized suppliers of table eggs competing for the market are ELFORA, Kalehiwot, Genesis and NACID. These Commercial suppliers have fairly established production and distribution facilities. The share distribution of commercial suppliers of poultry meat to Addis Ababa market is shown in Table 1.

Table 1: Commercial Supplies of Poultry Meat (2005/06)

supplier	Quantity(Tons)	Share (%)
ELFORA	368.6	52.0
Almaz Poultry Farm	168.5	23.8
Alema Poultry Farm	156.0	22.0
Tsedey Poultry Farm	15.6	2.2
total	708.7	100

Source: Annual Performance Review of ELFORA (2005/06)

Production systems of chicken summarized by its characteristics in Table (2) as follows:

Table 2: Characteristics of the different poultry production systems

Characteristic	commercial	Small scale market oriented	Traditional
Breed and flock size	Specialized breeds: 2,500–50, 000 (18 farms)	Specialized and dual-purpose breeds: 50–1000	Local indigenous type: <50
Housing	Modern housing, generally with concrete walls and regulated internal environment	Varies from modern houses to simple housing made from locally available materials	Specific poultry houses are rare
Feed resource	Commercially compounded feeds	Commercially compounded, homemade mixtures and scavenging	Scavenging and occasional feeding with home grains and refuse
Health program	Standard and regular animal health program	Disease control and health program at varying levels	No regular health program
Markets	Cold chain system for input-output distribution	Input and output distribution is based on existing trading centers	No formal marketing channels

Source: FAO (2007)

2.2. The chicken meat consumption in Ethiopia

As pointed out by Sonaiya (1990), in recent years, rural poultry have assumed a much greater role as suppliers of animal protein for both rural and urban dwellers. This is because of the recurrent droughts, disease and decreased grazing land, which have resulted in significantly reduced supplies of meat from cattle, sheep and goats. Poultry is the only affordable species to be slaughtered at home by resource-poor farmers, as the prices of other species are too high, and have increased substantially in recent years. Consumption of pork is not allowed for religious reasons for most Ethiopians (Orthodox Christians and Muslims) but fortunately there are no such cultural or religious taboos in relation to the consumption of poultry and poultry products.

According to Alemu (1987) the per capita consumption was about 2.85 kg of chicken meat per annum in Ethiopia, which are very low figures by international standards. Although there are no current data on the present per capita consumption of poultry products, a similar or even declining trend is probable because the population of Ethiopia has increased by about 3% per annum over the last ten years without any marked increase in the production of poultry meat. Innovative ideas and programs are therefore required to promote rural poultry production for the improvement of rural household incomes and nutrition.

Poultry meat are relatively cheap and affordable sources of protein for most consumers compared to other animal products such as beef. Consumption of poultry products is more common in urban than in rural areas. Poultry consumption is commonly high during holiday periods. The national poultry meat consumption is estimated, on an average to be 69,000 tons per annum (ILRI, 2000). In the mid-1990s, the per capita poultry meat consumption in Ethiopia was estimated about 2.85 kg (Alemu and Tadele, 1997). This figure is very low by international standards. Currently, the prices of animal products particularly beef and lamb have become dearer particularly for the urban consumers. This could have implications for poultry consumption.

FAO (2009) reported that there is a strong positive relationship between the level of income and the consumption of animal proteins. According to Dagher (2009) the current growth of poultry production and consumption makes a good case for the need and desire for future growth of the poultry industry. Dave (2007) also reported that poultry consumption is expected to grow at 2 to 3% per year.

According to David (2010), chicken meat is the best source of quality protein for those who are under-nutrition in sub-Saharan Africa (SSA) and South Asia. Muchenje et al. (2001) reported that poultry provide major opportunities for increased protein production and incomes for smallholder farmers. Abedullah and Bakhsh (2007) noted that the major contribution of poultry consumption in improving per capita nutrients level is well documented.

Village chicken in Ethiopia provides 12.5 kg of poultry meat per capita per year, whereas cattle provide only 5.34 kg” (Kitalyi, 1997). According to Windhorst (2008), an increase in poultry meat consumption for least developing countries is 26 and 2.4%, compared with only 2.4 and 1.6% in the most developed countries. FAO (2010) reported also that chicken meat is relatively healthier than others; containing low total fat and it has high desirable monounsaturated fats. Costa (2009) described the attributes of chicken meat to its intensively based and

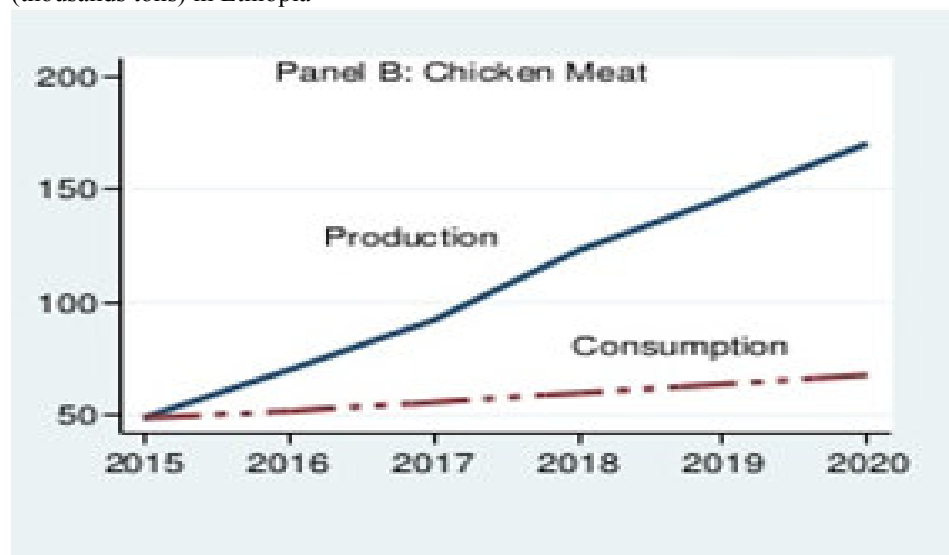
vertically integrated operation. Furthermore, Paweł (2005) reported that consumption of poultry and fish has not been found to be associated with increased risk of cancers. FAO (2010) reported that the human population benefits greatly from poultry meat and eggs, which provide food containing high-quality protein, and a low level of fat with a desirable fatty acid profiles. Arrey (2009) reported also that the possibility of village poultry as a viable sector to boost protein deficiencies. To improve chicken production and to satisfy the demands of protein foods, participation of family members in the household is highly required in the phenomena of poultry productions.

Table 3: African human population and poultry meat consumption

Country	Human population in million				Poultry meat consumption (kg/person/year)		
	2000	2010	2015	2020	2000	2007	2009
Ethiopia	65.6	83.0	92.0	101.1	0.6	0.6	0.6
Egypt	67.7	81.1	88.2	94.8	8.6	10.5	10.0
Kenya	31.3	40.5	46.3	52.6	0.4	0.6	0.6
Nigeria	123.7	158.4	179.8	203.9	1.3	1.7	1.7
Somalia	7.4	9.3	10.6	12.2	-	-	-
Togo	4.8	6.0	6.7	7.3	4.1	4.4	6.0
Uganda	24.2	33.4	39.1	45.4	1.8	1.4	1.4

Source: <http://www.thepoultrysite.com/articles/2973/global-poultry-trends-2013-continued-upward-trend-in-chicken-consumption-in-africa-and-oceania/>

Figure 3. Positive production-consumption balances projected for GTP II(2015-2020) for chicken Meat (thousands tons) in Ethiopia



Source: <https://www.google.com/search?q=chicken+meat+consumption+trends+in+ethiopia>

Compared with some food substitutes, poultry meat is distinguished for its low energy concentration and, consequently, it has high nutrient density (Table 2). Poultry meat, as well as other meats, is a good source of high biological value protein (20-22%). Furthermore, it provides iron and zinc of high bioavailability in lower quantities than red meats, but important amounts compared with food of vegetable origin. Poultry meat has significant content of vitamins from group B such as thiamin, riboflavin, niacin and vitamin B6, although vitamin B12 content is less than in other meats. The quantity of vitamin E, pantothenic acid, folic and biotin of poultry meat is considerably low. Recent analyses have determined that in addition to vitamin D, the 25-hydroxycholecalciferol metabolite (5 times more activity than calciferol) is present in meat (Ovesen et al., 2003).

The quantity of fat in poultry meat differs according to the edible portion: 2.8 g/100 g breast, 10 g/100g whole carcass, 13 g/100g thigh with skin and 70 g/100 g skin. Significantly, poultry meat has a low total fat quantity and, more importantly a higher monounsaturated and polyunsaturated fatty acid (MUFA and PUFA) content than other meats. Nutritional recommendations include the reduction of total fat, saturated fat and cholesterol consumption in order to prevent the incidence of most common chronic disorders (Ovesen et al., 2003).

Of all the meat constituents, the lipid fraction has the highest susceptibility to modification, in contrast to protein with amino acidic composition determined by the genetic code. Different studies have focused on the use of dietary strategies to improve the quality of the poultry carcass and meat. One of the objectives of this modification is to increase the amount of unsaturated FA, especially the omega 3 (n3) families which has beneficial effects on human health. Nevertheless, as will be explained, increasing the un-saturation degree of the meat leads

to organoleptic and nutritional problems and requires assessment of the oxidation processes of the lipid fraction. Thus, the relation vitamin E/PUFA of the poultry meat must be taken into account (Ovesen et al., 2003).

Table 4. Nutritive value of poultry meat, per 100g of edible portion

	Whole	Breast		Whole	Breast
Water (g)	70.3	75.4	Vitamins		
Energy (kcal)	167	112	Vitamin B ₁ (mg)	0.1	0.1
Protein (g)	20.0	21.8	Vitamin B ₂ (mg)	0.15	0.15
Total fat (g)	9.7	2.8	Niacin eq. (mg)	10.4	14
SFA (g)	2.6	0.76	Vitamin B ₆ (mg)	0.3	0.42
MUFA (g)	4.4	1.3	Biotin (µg)	2.0	2.0
PUFA (g)	1.8	0.52	Folic acid (µg)	10	12
PUFA/SFA	0.69	0.69	Vitamin B ₁₂ (µg)	0.4	0.4
Cholesterol (mg)	110	69	Vitamin C (mg)	—	—
Minerals			Vit. A: Eq. Retinol (µg)	9	16
Calcium (mg)	13	14	Vitamin D (µg)	0.2	0.2
Iron (mg)	1.1	1.0	Vitamin E (mg)	0.2	0.29
Iodine (µg)	0.4	0.4	Vitamin K (µg)	—	—
Magnesium (mg)	22	23			
Zinc (mg)	1	0.7			
Selenium (µg)	6	7			
Sodium (mg)	64	81			
Potassium (mg)	248	320			
Phosphorus (mg)	147	173			

Source: Moreiras et al., (2005).

2.3. Constraints

2.3.1. Constraints of Poultry Production in Ethiopia:

2.3.1.1. Disease and predators

According to Moges et al. (2010), Getu and Birhan (2014), Negussie and Ogle (1999) and Mengesha et al. (2011) under farmer management poultry production, prevailing disease, predators and veterinary services were reported as the major constraint. Moges et al (2010) suggestion improvement in veterinary and advisory service could help to achieve control of diseases at village level. According to Besbes and B., (2009) as well as Halima and H., (2007) high incidence of chicken diseases, mainly (NCD) is the major and economically important constraints for village exotic chicken production systems. Niguse et al (2003), Serkalem et al (2005) and Newanta et al (2008) showed that NCD is highly infectious and causes more losses than any other diseases in the tropics, spreads rapidly through the flock and mortality could reach up to 100%. High mortality of chicks under village chicken production in the central highlands of Ethiopia was due to diseases, parasites, predation, lack of feed, poor housing and insufficient water supply (Tadelle and Ogle, 2001).

Newcastle disease (ND), Infectious Bursal disease (IBD) or Gumboro, Marek disease (MD), Fowl typhoid, Cholera, Mycoplasmosis and Coccidiosis are widely distributed in most African countries. According to Chaheuf (1990), Ethiopia is not exception to this situation (Adene, 1996). Losses attributed to Newcastle disease is estimated at about 57.3% of the overall annual chicken mortality whereas fowl pox, Coccidiosis, and predation accounts for about 31.6%, 9.4% and 1.7% of the total annual flock mortality respectively (Negussie and Ogle(1999). Survey conducted in Southern Ethiopia identified Fowl cholera followed by New Castle Disease, Coccidiosis, Fowl influenza [Infectious Bronchitis], Fowl pox, Fowl typhoid and Salmonella to be the major poultry diseases respectively (Abera, 2007) .

According to Solomon (2007) the health status of the backyard poultry production system is very poor and risky, since 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 compounds used by households and children. There is no practices (even means) of isolating sick birds from the household flocks and dead birds could sometimes be offered or left for either domestic or wild predators. Yilma (2007) reported that health measures at the government owned poultry breeding and multiplication centers were extremely poor. The basic hygienic practices are often disregarded and husbandry know-how are generally lacking. Foot-bath application, if at all it is practiced, was only when people enter the poultry houses but not when they leave poultry houses. Almost all the

breeding and multiplication centers were devastated by the outbreak of Infectious Bursal Disease i.e. Gumboro disease. The health status in many of the small scale intensive poultry farms is extremely poor (Abebe, 2006).

2.3.1.2. Nutritional constraint

According to Tegene (1992), Tadelle and Ogle (1996b), and Alemu and Tadelle (1997) crop analysis result indicated that the physical proportion of seeds was higher in the short rainy season and the concentration of crude protein; calcium and Phosphorus were below the recommended requirements for meat and egg production. The scavenging feed resource is deficient in protein, energy and probably calcium for layer birds, indicating the role of supplementation in bringing a considerable increase in egg and meat production (Tadelle and Ogle (1996b).

2.3.1.2.1. Feed availability

According to Tadelle et al., (2010), Demeke (2004), Dessie et al.,(2013) and Mazengia et al., (2012) poultry feed and nutrition is one of the most critical constraints to poultry production under both the rural small holder and large-scale systems in Ethiopia. The problem is mainly associated with lack of processing facilities, inconsistent availability and distribution and sub-standard quality of processed feeds. Regular availability of good quality feed ingredients and a fully balanced complete feed are essential for efficient poultry production. Grains, cereal by-products, oil seed cakes and meat and bone meal are obtained locally. The shortage in the supply of grains especially corn is improving due to the increase in the production of corn in recent years. The most serious problems arise from the unavailability of suitable micro-nutrient sources such as vitamins and minerals.

2.3.1.2.2. Feed quality

Yami and Desie (1997) reported that the quality of mixed feed for commercial poultry production is generally poor in Ethiopia. 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. Similarly, unavailability of feed quality legislation and laboratory facilities for chemical analysis also contributes greatly to the poor quality of processed feeds. Currently, understanding the problem the Ethiopian Quality and Standards Authority is working with the Ethiopian Society of Animal Production (ESAP) on feed quality standards and legislation (Tadelle et al., 2002; Demeke, 2004; Dessie et al., 2013; Mazengia et al., 2012).

2.3.1.2.3. Feed cost

The price of raw materials varies according to source of supply and region. Little attention is given to the least cost formulation of rations. It is believed that considerable scope exists to reduce the price of feed in some areas without reducing its nutritive value. Transport costs add significantly to the cost of feed in areas distant from the source of supply. The absence of bulk deliveries and storage has increased feed costs. In some cases, a lot of wastage occurs due to weevil infestation. The shortage in the supply of protein supplements of animal origin has made the price of abattoir by-products 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 even at times when the price of the major component of mixed rations (e.g. corn) fall by more than fifty percentage (Tadelle et al., 2002; Demeke, 2004; Dessie et al., 2013).

2.3.1.3. Lack of proper housing

According to Dwingeret.al, (2003) lack of housing is one of the constraints of the village poultry production systems. In some African countries, a large proportion of village poultry mortality accounted due to nocturnal predators because of lack of proper housing. Some research works also indicated that the mortality of scavenging birds reduced by improved housing. For instance, in the Gambia livestock improvement program, which included improved poultry housing resulted in lower chick mortality (19%) relative to that observed in Ethiopia (66%) and Tanzania (33%), where no housing improvements were made (Kitalyi, 1998).

2.3.1.4. Weak agricultural extension services

According to Moges et.al, (2010b) reported that agricultural extension service in Ethiopia is provided almost solely by the government. A holistic and multi-disciplinary support of services like extension, training, veterinary and credit are critical in supporting village chicken improvement programs (ILRI, 2005).

Mengesha et al., (2011) reported that 50% of chicken owners used agricultural extension services on poultry productivity in south Wollo, Jamma district. It is also reported that training for both farmers and extension staff focusing on disease control, improved housing, feeding, marketing and entrepreneurship could help to improve productivity of local chicken (Moges et al., 2010b).

2.3.2. Constraints of Poultry meat consumption in Ethiopia

2.3.2.1. Religion

According to the belief of Ethiopian Orthodox Tewahedo Christians, the faithful must abstain from eating meat and dairy products to attain forgiveness of sins committed during the year, and undergo a rigorous schedule of prayers and atonement. Therefore, followers do not eat meat and dairy products (i.e. egg, butter, milk, and cheese) on fasting days such as Wednesdays and Fridays except the 50 days running from Easter, the Fast of the Prophets, the fast of Nineveh, Lent, the Fast of the Apostles and the fast of the Holy Virgin Mary (Teklehaimanot, 2005). The Ethiopian Orthodox Christians follow fasts in a way similar to other Orthodox Christians but with a frequency of approximately 250 days in a year (Rakesh and Tafesse, 2010).

Alike to the consumption of meat, the periods of low bird sales and consumption coincide with Orthodox Christians fasting; 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 (Betru and Kawashima, 2009). 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.

2.3.2.2. Gender

Consumption of chicken in respect to the Ethiopian people has very cultural practices, that is, the preparation process of the national dish, Doro wat, has strict traditional guidelines and gendered roles. Cuisine may vary from region to region but regardless of their religion, Ethiopian women learn the ritualized process of making this traditional dish as a 'rite of passage' (Natasha, 2011). The chicken is halal or kosher slaughtered by men after having been blessed. Killing animals is a job reserved for men but only women know how to cook it - men are not allowed into the kitchen. A 'proper' lady knows how to cut a chicken into 12 perfect pieces (Janet et al., 2013). According to Natasha (2011), women begin the laborious task of cleaning the carcass. The women then cut the chicken into 12 pieces. This is done very precisely so that each wing, leg, chest, thigh, back and breast mirror each other and all veins are done away with. In the West, of course, chicken is processed before being packaged and can be bought ready to cook from the grocery store. Ethiopian women, however, buy the whole live chicken and cut it up in the traditional manner.

2.3.2.3. Production constraints

Under poultry production, prevailing diseases, predators and poor feeding were reported as constraint highly affects production and consumption as cited by Moges et al. 2010a; Dinka et al. 2010 and Mengesha et al. 2001. Scavenging feed resource base for local birds are inadequate and variable depending on season which affects production as well as consumption of poultry products (Hoyle 1992 and Alemu and Tadelle, 1997). The high mortality of chicks under village chicken production in the central highlands of Ethiopia is due to diseases, parasites, predation, lack of feed, poor housing and insufficient water supply (Tadelle, 2001). Among the infectious diseases, Newcastle disease, salmonellosis, coccidiosis and fowl pox are considered the most important causes of mortality in local chicken while predators are an additional causes of loss (Eshetu et al., 2001). According to Negussie and Ogle (1999), losses attributed to Newcastle disease is estimated at about 57.3% of the overall annual chicken mortality whereas fowl pox, coccidiocis, and predation accounts for about 31.6, 9.4 and 1.7% of the total annual flock mortality, respectively.

2.3.2.4. Income level

There has been a positive trend of meat consumption in the developing countries. Delgado (2003) called this trend a Livestock Revolution. This revolution has been driven by population growth, urbanization and income change. He advises governments and development partners in developing countries who want to help the malnourished people to follow the revolution closely. Observations like this often understate the unequal distribution of income growth and non-uniformity of rate of urbanization in different parts of the developing countries. For example, the projection by Alexandratos (1995) suggested that the poor developing countries will remain dependent more on cereals and less on livestock consumption for daily energy in the future.

Ethiopian per capita meat consumption has been very low and could not be considered as essential part of daily household nutrition. The consumption and its response to income change has distinct pattern between urban and rural households. More than 40% of meat in the country is consumed in urban areas. Per capita meat consumption in urban households changes more steeply with change in per capita income compared with rural households. The total national meat consumption made improvement between 1996 and 2000 as a result of improvement in response of rural household meat consumption to income gain. Per capita meat consumption in Ethiopia is significantly affected by urbanization and level of income than meat price and cereal production. Therefore, improvement in meat consumption in Ethiopia could occur only if rural consumption pattern changes or urbanization proceed at faster rate and income level of urban households get better (Shawel and Kawashima, 2009).

3. CONCLUSION AND RECOMMENDATION

In Ethiopia, about 95.86% of the total national poultry products (eggs and meat) are contributed by indigenous chickens kept under village management system while the remaining 1.35% is obtained from intensively kept exotic breed of chickens and 2.79% are obtained from hybrids.

Poultry products offer affordable quality animal protein sources for the smallholder farm households and also that chicken meat is relatively healthier than others; containing low total fat and it has high desirable monounsaturated fats. Chickens are consumed mostly during holidays. In general, poultry consumption accounts for less than 1% of the total annual food needs of farm households.

The poultry sector in Ethiopia can be characterized into three major production systems based on some selected parameters such as breed, flock size, housing, feeding, health, technology and bio-security. These are

large scale commercial poultry production system, small-scale commercial poultry production system and village or backyard poultry production system.

Under poultry production prevailing disease, predators, nutrition, poor housing, weak agricultural extension service, low income level, religion and gender are major constraints to poultry production and its meat consumption in Ethiopia.

From this review I recommend that:

- ◆ To increase poultry production and meat consumption domestication of other poultry species (turkeys, ducks, geese, ostriches, guinea fowls, doves and pigeons) and solving of all the constraints is better.
- ◆ Since little productivity of indigenous breeds special emphasize should be given to exotic poultry production with improved management and health care.
- ◆ To improve poultry production it is better to use large scale production system at urban area, small scale production system at urban and per-urban area, and village production system with better supplementations at rural area.
- ◆ Since poultry are highly nutritious, so the consumption behavior should not be restricted to only holidays.

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