



Review Article

Review on poultry production, processing, and Utilization in Ethiopia

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Abstract

The Ethiopian poultry population (chicken) is projected to be around 56.06 million, with indigenous, hybrid, and foreign breeds accounting for 88.19 percent, 6.45 percent, and 5.36 percent of the total poultry, respectively. Ethiopian poultry farming methods are typically low-productivity subsistence systems. This paper will now collect data on chicken kinds used for meat and egg production, as well as their use, difficulties, and potential in Ethiopian poultry productivity. It also discusses Ethiopian poultry production methods, their contributions, and challenges such as feed shortages, predators, disease, veterinary service, health management, marketing, genetic quality (breed), and Extension service issues. However, information covers both the past and the present; production options include training and extension services, veterinary services, market access, financial services, and the requirement for limited space and inputs. As a result, certain actions must be taken immediately to alleviate these limits and boost the poultry's production potential.

Introduction

The worldwide poultry population is predicted to be at 16.2 billion people, with 71.6 percent living in developing countries, producing 6.7 million tons of chicken meat and 5.8 million tons of hen eggs [1]. Poultry, particularly chickens, is the world's most extensively kept and numerous livestock species [2]. Village poultry accounts for more than 70% of poultry products and 20% of animal protein consumption in Africa [3]. In poor nations, poultry production has significant economic, social, nutritional, and cultural benefits [4]. Providing high biological value animal protein in the form of eggs and meat [5,6]. The Ethiopian poultry population (chicken) is projected to be around 56.06 million, with indigenous, hybrid, and foreign breeds accounting for 88.19 percent, 6.45 percent, and 5.36 percent of the total poultry, respectively [7].

Poultry species originated from South East Asia and were domesticated from red jungle fowl FAO [8,9]. All domestic birds, such as chickens, turkeys, ducks, geese, ostriches, guinea fowls, and pigeons, are considered poultry. Because other forms

of poultry are essentially unknown as sources of egg and meat [10], the term poultry is identical to domestic chicken (*Gallus domesticus*). Except for chickens, the others are found in their natural habitat in Ethiopia, although geese and turkeys are not [11]. Ethiopian chickens are the most common, with chickens being owned by almost every rural family [12]. They provide a crucial source of protein and revenue for the family. Chicken production is vital for developing countries' socioeconomic development [13].

Chicken farming is a significant and fundamental element of most households in Ethiopia, as it is in other poor nations, in rural, urban, and peri-urban settings, allowing farmers to reap the advantages of high-quality protein in the form of eggs and meat while simply scavenging feed resources [14].

As Wiebe [15] stated, chicken meat and egg production is the most environmentally friendly animal protein production method, and poultry meat accounts for around 33% of total global meat output, stated to FAO [16]. Women choose poultry and egg sales because they provide quick cash and self-sufficiency. To all available evidence, Ethiopians consume



one of the lowest levels of poultry and poultry products in the world: 57 eggs and 2.85 kg of chicken meat per year [17,10].

Nonetheless, in the face of Ethiopia's population growth, per capita consumption of egg and poultry meat has decreased by 0.12 and 0.14, respectively, USAID [18]. As stated by Pawe [19], eating poultry and fish does not raise the risk of cancer, and FAO [20] indicated that chicken meat is healthier than other meats since it contains less total fat and more good monounsaturated fats. By 2020 GTP II (2015–2020), the Ethiopian Livestock Master Plan has set ambitious goals to raise chicken meat production by 247 percent and egg production by 828 percent. As a result, the purpose of this article is to provide an overview of the different varieties of chickens used for meat and egg production, as well as the opportunities and challenges of poultry production in Ethiopia.

Ethiopian poultry production overview

In Ethiopia, chicken is primarily a backyard operation with a few low-productivity scavenging birds. The eggs and meat produced in this way are insufficient to supply the increased demand for eggs and poultry meat in metropolitan areas. The price of eggs and meat has been steadily rising, indicating rising local demand [21]. Poultry farming offers considerable economic, social, and cultural benefits in developing nations, and it plays an important part in family nutrition. The average number of birds kept by rural households is five or six [22]. Based on various selected factors like breed, flock size, housing, feeding, health, technology, and bio-security, Ethiopia's poultry sector can be divided into three primary production systems FAO [23]. Large-scale commercial poultry production systems, small-scale commercial poultry production systems, and village or backyard poultry production systems are the three types of commercial poultry production systems [24]. Each can coexist indefinitely and contribute to the resolution of diverse target societies' socioeconomic challenges [12].

Poor input, low output, and the recurring destruction of a major proportion of the flock due to disease outbreaks characterize the backyard poultry production system [11]. Conferring to [25], in Ethiopia, price fluctuations in village hens and chicken products were primarily linked to customer purchasing power, fasting, and product availability. Agreeing to [26], the microeconomic level of poultry is extremely important in Ethiopia, particularly for women. Tadelle [11], the majority of the eggs produced in the same country were used for hatching, followed by sale and home consumption, while more birds were used for sale, replacement, and consumption. Women and children, in particular, benefit from raising poultry since it provides them with an income source, and they are thus the most economically sensitive to the crippling impacts of rural poverty [21].

Backyard poultry production system

Village poultry production in Ethiopia contributes 99.2 percent of national chicken meat production with an annual

output of 72,300 metric tons of meat [17], making it an important part of the national economy in general and the rural economy in particular. The key management difficulty of backyard poultry production systems is feed content and supplementation, irrigation, sanitation, veterinary service, and housing [27]. Conferring to [28] and [29], village chicken is raised in northwest Ethiopia for a variety of uses, the first of which is the sale of village chicken for monetary earning (51 percent). Chickens are raised in free-range systems in most villages, with the majority of their diet coming from scavenging: insects, maggots, seeds, and plant materials, with very tiny amounts of grain crop and table waste supplements from the home. It covers 95–98 percent of the country's chicken production system and is not profitable due to its lack of market orientation. It has a tiny flock size (5–20 hens per home), and indigenous breed types rely on locally available feed as a supplement, as well as poor health care and other management techniques [30].

System of commercial poultry production on a small scale

A medium amount of feed, water, and veterinary service inputs, as well as a minimum to poor bio-security, describe the small-scale intensive production system [31]. In Addis Ababa's urban and peri-urban districts, small flock numbers of 50 to 500 exotic varieties raised for commercial purposes are prevalent. On the other hand, [30] claims that each family has a flock of 50–200 enhanced breed chickens. The Bureau of Agriculture, Cooperatives, and the Bishoftu Agricultural Research Center, in collaboration with some small-scale modern chicken producers, provide breeding seeds and promote improved poultry and feeding technology [31].

Commercial poultry production system on a large scale

The large-scale commercial production system is a very intensive production system including an average of greater than or equal to 10,000 birds kept indoors under medium to high bio-security standards. Fertile eggs, table eggs, day-old chicks, broiler meat, and adult breeding stocks are provided by large-scale commercial poultry to small-scale modern poultry farms. It is distinguished by a higher degree of productivity, as chicken production is fully market-driven to meet the strong demand for chicken in major cities, and it employs a diverse workforce ranging from chicken attendants to truck drivers to professional managers [30]. Alema poultry farms are the country's second-largest commercial chicken farms, producing over half a million broilers each year for the Addis Ababa market. The farm's parent stock of broilers, feed processing factories, hatchery, slaughterhouses, cold storage, and transportation facilities are all owned by the farm [24]. In the country, there are roughly 35 large-scale commercial chicken farms with a capacity of 1,000 to 10,000 birds. Many of them are purposely situated in a 100-kilometer corridor south of Addis Ababa to have easier access to feed, veterinary services, other inputs, and market outlets in Addis Ababa [32] [Table 1].



Table 1: Commercial Poultry Meat Suppliers (2005/06) Share of Supplier Quantity (Tons) (percent).

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: ELFORA's annual performance review (2005/06).

Poultry production's role in Ethiopia

Poultry plays a significant socioeconomic importance in terms of food security, supplementary financial flow, and religious/cultural reasons. Rural chicken generates 98.5 percent and 99.2 percent of national egg and chicken meat output, respectively [33,34], and is a substantial part of the national economy in general and the rural economy in particular. Village chicken-raising [35] is the practice of maintaining chickens in rural households employing family effort. Due to its low cost of production, village chicken has a considerable impact on the national economies of developing nations, as well as its role in improving the nutritional status, income, food security, and livelihood of many smallholders [36-39]. Poultry remains an important part of farming systems and household economies in rural communities, while large and small-scale commercial poultry industries in cities and towns play a critical role in providing safe, high-quality products for urban consumers [40]. Poultry production is used to provide employment and income-generating opportunities and is a priority animal for holy days and religious sacrifices, [27,41,42].

Ethiopian chicken breeds used for meat and egg production

In Ethiopia, both types of chicken egg-laying and meat-producing varieties are known as dual-purpose breeds [43,44]. The eggs of the parent stock are usually imported from other nations. The generations are then utilized to produce eggs, while the parent stock is employed in the hatchery. Previously, multiple layer breeds were imported to Ethiopia, but now just three (Bovans Brown, Issa Brown, and White Leghorn) are used for egg production, and White Leghorn are given comparatively little meat at the end of the laying season [44,45]. Babcock is a chicken breed that is currently being brought into Ethiopia for fattening or meat production [44,46].

Ethiopian poultry production utilization

The global production and consumption of poultry have increased [47]. Poultry meat accounts for roughly 33% of worldwide meat consumption (87 percent chicken and 6.7 percent Turkey) [48]. Similarly, customer demand for chicken meat has been continuously increasing over the previous decade [49]. Conferring to the FAO [48], poultry meat and eggs benefit the human population by providing meals with high-quality protein and low-fat levels with optimal fatty acid profiles. Indigenous chickens kept under village management contribute approximately 95.86 percent of total national poultry products

(eggs and meat), whereas an intensively kept alien breed of chicken contributes 1.35 percent and hybrids contribute 2.79 percent [50]. There are unique trends in Ethiopian per capita meat consumption and its response to income change between urban and rural families.

Agreeing to all available evidence, Ethiopians consume one of the lowest levels of poultry and poultry products in the world: 57 eggs and 2.85 kg of chicken meat per year [10,17]. Local chickens comprise approximately 99.2 percent of overall chicken meat production in Ethiopia, with an average yearly

Table 2: Ethiopia's estimated poultry meat and egg consumption kg/per capita in 2010.

	Rural	Urban	National
Poultry meat(kg)	0.08	0.16	0.12
Eggs(kg)	-	-	0.14
Population growth(%)	2.5(85 in urban)	5(16 in urban)	3

Source: [66].

Table 3: Per 100g of the edible part, the nutritional value of poultry meat.

	Whole	Breast	Vitamins	Whole	Breast
Water(g)	70.3	75.4	VitaminB1(mg)	0.1	0.1
Energy(kcal)	167	112	VitaminB2(mg)	0.15	0.15
Protein(g)	20.0	21.8	Niacin eq.(mg)	10.4	14
Total fat(g)	9.7	2.8	VitaminB4(mg)	0.3	0.42
SFA(g)	2.6	0.76	Biotin(µg)	2.0	2.0
MUFA(g)	4.4	1.3	Folic acid(µg)	10	12
PUFA(g)	1.8	0.52	VitaminB12(µg)	0.4	0.4
PUFA/SFA	0.69	0.69	Vitamin C(mg)	-	-
Cholesterol(g)	110	69	Vitamin Retional(µg)	9	16
Minerals			Vitamin D(µg)	0.2	0.2
Calcium(mg)	13	14	Vitamin E(mg)	0.2	0.29
Iron(mg)	1.1	1.0	Vitamin K (µg)	-	-
Iodine(µg)	0.4	0.4			
Magnesium(mg)	22	23			
Zink(mg)	1	0.7			
Selenium(µg)	6	7			
Sodium(mg)	64	81			
Potassium (mg)	248	320			
Phosphorus(mg)	147	173			

Note: MUFA = Mono Unsaturated Fatty Acid, PUFA = Poly Unsaturated Fatty Acid, SFA=Saturated fatty acid

Source: [59].

output of 72,300 metric tons [11,51]. The production of both egg and chicken meat has been linked to closing the gap in animal protein supplies for human consumption [52] [Tables 2,3].

Poultry production in Ethiopia: Opportunities and challenges

[Tables 4,5]

**Table 4:** Ethiopian poultry production opportunities.

Opportunities	Reference
Training and extension service	[53,54]
Veterinary service	[53-55]
Market access	[53,54,56]
Credit service	[53,56]
Feed access	[53,54]
Needs a minimal amount of space and inputs, a little amount of cash to get started, a short payback period, high demand, and a good source of human nutrition and income	[57,58]

Table 5: Common challenges of poultry production in Ethiopia.

Major- challenges	Reference
Feed	[54,59-61]
Predators	[33,34,53,56,59,62,63-67]
Disease	[33,59-62,66,68-72]
Veterinary service	[64-67]
Marketing	[35,56,59,64,67,73-75,]
Genetic quality(Breed)	[33,59,62,65,76]
Extension service	[77-79]

Conclusion

Ethiopian chickens are the most common, with chickens being owned by practically every rural family and providing a major source of protein and revenue. Chicken meat is healthier than other meats because it contains less overall fat and more beneficial monounsaturated fats. Ethiopia has one of the lowest per capita poultry and poultry product consumption rates in the world, with 57 eggs and 2.85 kg of chicken meat consumed each year. The Ethiopian Livestock Master Plan has set big goals for chicken meat production to increase by 247 percent and egg production to expand by 828 percent by 2020. Poultry plays a crucial socio-economic function in terms of food security, supplementary financial income, and religious/cultural reasons. The production of egg and chicken meat has unquestionably been linked to closing the gap in animal protein supplies for human use. Feed shortages, predators, disease, veterinary care, health management, marketing, genetic quality (breed), and Extension service concerns can all hinder poultry production in Ethiopia.

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