






# Poultry Production in Afghanistan: Trends, Challenges, and Future Prospects

Noor Aminullah<sup>1\*</sup> , Mohammad Naeem Azizi<sup>1</sup> , and Mohammad Dawood Bawer<sup>2</sup> , Obaidullah Mahaq<sup>3</sup> , and Mahboobullah Ahmadi<sup>1</sup> 

<sup>1</sup>Department of Pri-Clinic, Faculty of Veterinary Science, Afghanistan National Agricultural Sciences and Technology University (ANASTU), Kandahar 3801, Afghanistan

<sup>2</sup>Department of Para-Clinic, Faculty of Veterinary Science, Afghanistan National Agricultural Sciences and Technology University (ANASTU), Kandahar 3801, Afghanistan

<sup>3</sup>Department of Animal Nutrition and Production, Faculty of Agriculture, Afghan International Islamic University (AIU), Kabul 1004, Afghanistan

\*Corresponding author's E-mail: [aminullah.noor18@gmail.com](mailto:aminullah.noor18@gmail.com)

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## ABSTRACT

The demand for poultry products is steadily increasing globally as well as in Afghanistan, driven primarily by human population growth, economic development, and urbanisation. A clear understanding of Afghanistan's poultry sector is crucial for policy direction towards food security and rural development. The present study aimed to evaluate the current status of poultry farming and highlight the key challenges and future view of poultry production in Afghanistan. The study was synthesized from the available literature, government reports, and international datasets to provide a coherent overview of Afghanistan's poultry sector. Particular attention was given to identifying data inconsistencies and research gaps to guide evidence-based policies. The trend of investment in Afghanistan's poultry sector increased from 0.5 billion AFN (71.42 million USD) in 1986 to 200 billion AFN (2.85 billion USD) in 2022. Currently, a total of approximately 11,000 commercial poultry farms are operating across the country, which can produce about 219,000 metric tons (MT) of meat, while the total market demand is estimated as 295,000 MT in 2024. The available poultry meat in Afghanistan covers only approximately 46% of the World Health Organization's recommended rate per capita. However, the sector development is hindered by different factors such as traditional practices, poor infrastructure, lack of technical expertise, disease outbreaks, uncontrolled use of antimicrobial agents, poor input quality, and end-product price variation. The poultry sector's average annual growth rate in Afghanistan is estimated as 13.8%, and the future production capacity is projected to reach 400,332 MT by 2030. Poultry production in Afghanistan is gradually increasing, driven by growing market demand. However, the current production level still cannot meet the market demands in the country. The present findings contribute to a clearer understanding of poultry development priorities for national food security and sustainable growth in Afghanistan.

**Keywords:** Chicken, Market, Meat, Poultry production

## INTRODUCTION

Globally, the overall meat production from animal sources was reported to be 400 million metric tons (MT) in 2023, representing a significant increase from 179.45 million MT in 1990 (Ritchie et al., 2023). The trend in meat production has reported a total annual growth of 3.58%, whereas poultry meat consumption shows a 5.18% increase per year (Memon et al., 2021). Poultry products, including meat and eggs, play a significant role in providing essential nutrients, such as energy, protein, amino acids, and minerals for human nutrition (Farrell,

2013). The global human population is projected to exceed 9.7 billion by 2050 (Berners-Lee et al., 2018). This upward trend is a direct factor that drives the rising demand for poultry products in the market, leading to increased poultry production at the farm level. It is reported that poultry production is the fastest-growing sub-sector compared to any other agricultural segment, particularly in developing countries, such as Afghanistan (World Bank, 2015). The poultry sector offers comparative benefits, including easier management, greater productivity, and a quicker return on investment

compared to other livestock industries (Azizi et al., 2021). In smallholders as well as in both rural and urban areas, the poultry sector plays a vital role in alleviating poverty and contributes to the families' income and nutrition (Bist et al., 2024).

The agricultural and livestock sectors are the cornerstone of Afghanistan's economy and social framework. The livestock production sector makes a significant contribution to poverty reduction and livelihood sustainability, providing job opportunities, particularly in the rural regions of developing countries such as Afghanistan (Azizi, 2024). Historically, the poultry sector in Afghanistan has been more traditional, characterized by small-scale operational units (Emal and Muhsni, 2017). Land-limited, low-income households often raise small livestock such as sheep, goats, and poultry for commercial purposes, as they require minimal initial investment and low operational costs (Muradi and Boz, 2018). The production potential of poultry native breeds, such as Golden, Naked Neck, and Watani, in Afghanistan remains very poor and has not significantly improved compared to the 1960s (Emal and Muhsni, 2017). Reports indicated that before 1963, the native chicken growth performance was as slow as 0.769 kg body weight at the age of four months (Sahota and Bhatti, 2003a) and produced about 30 eggs per year (Sahota and Bhatti, 2003b). However, the poultry sector is gradually shifting from a traditional backyard production system to more intensive and commercialized practices worldwide, as well as in Afghanistan (Wilson, 2021). Factors such as an improved economy and increasing urbanization trends among people are driving growth in the poultry sector (Zahir et al., 2024). Consequently, a significant portion of the protein required by humans is derived from poultry sources (FAO, 2023). However, several challenges hinder the development of poultry production in Afghanistan, including inadequate infrastructure, limited access to veterinary services, feed shortages, and ongoing socio-economic instability (Azizi, 2024).

A critical epidemiological situation, characterized by frequent disease outbreaks of viral infections such as Newcastle disease, infectious Bursal disease, and infectious bronchitis, posed serious challenges to production efficiency and farm performance in the poultry sector (Hafez and Attia, 2020). Market instability, price variation, and sector resilience with the international market are other serious challenges that the poultry production sector is facing. Ultimately, as Afghanistan moves towards economic recovery and agricultural commercialization and modernization, the poultry sector

stands as a promising resource for development and investment (World Bank, 2015). The availability of poultry products per capita, production capacity, demand, types of challenges, and potential impacts on the poultry sector, as well as future prospects, are issues that remain unclear. Despite growing attention, there is a lack of a comprehensive and updated synthesis that critically analyses the trends, constraints, and future prospects of poultry production in Afghanistan. Existing data are fragmented across different reports, creating uncertainty in national estimates and limiting policy formulation. Therefore, the present study aimed to discuss available information to assess the current status of poultry production in Afghanistan, identify key challenges and limitations, and explore future opportunities and policy directions for the sector development.

## METHODOLOGY

To complete the narrative review study, the most relevant available literature was collected from international academic journals indexed in online databases such as Web of Science, Scopus, and PubMed using keywords such as poultry rearing practices, poultry meat production and market demand, challenges and requirements, and trends of investment in the poultry production sector in Afghanistan. The data and information were also collected from accredited and the most relevant international organizations, such as the Food and Agriculture Organization (FAO), the World Health Organization (WHO), the World Bank, Our World in Data, and the website of the Ministry of Agriculture, Irrigation, and Livestock (MAIL) of Afghanistan. An inclusive approach was employed, prioritizing relevance over strict exclusion criteria, given the limited peer-reviewed literature available on Afghanistan's poultry sector. To complement the literature, qualitative observations were drawn from the authors' professional experiments recorded during veterinary and field services in Afghanistan from 2016 to August 2025. These observations served to illustrate prevalent, widely acknowledged practices and challenges in contexts where published data remains limited.

## THE CURRENT TRENDS OF POULTRY PRODUCTION IN AFGHANISTAN

The livestock sector contributed approximately 14% to the overall agricultural industry and provided around 3.3 million job opportunities in Afghanistan (World Bank, 2016). Meanwhile, the poultry subsector accounts for

about 4.81% of the agricultural sector and 9.84% of the livestock sector in the country (Khatami *et al.*, 2022). Therefore, the poultry subsector provided about 380,000 job opportunities across Afghanistan. The MAIL of Afghanistan reported that approximately 120,000 direct and 300,000 indirect employment opportunities were provided across the country in the poultry sector (MAIL, 2024). In Afghanistan, poultry farms are operated under two major rearing practices, primarily backyard and commercial poultry production (FAO, 2008; Siddiky, 2017). In some areas, such as semi-urban regions, production systems are primarily divided into three major components, including backyard poultry, semi-commercial, and commercial poultry production (Khatami *et al.*, 2022). The free-range backyard poultry production system is primarily employed in rural areas and plays a crucial role in generating income, providing family nutrition, creating job opportunities, empowering women, and alleviating rural poverty in impoverished communities (Siddiky, 2017).

Indigenous poultry breeds, such as the Golden, Naked neck, and Kulangi in Afghanistan, are well-adapted to local environmental conditions and have demonstrated superior resistance to prevalent diseases and fluctuating environmental factors (Siddiky, 2017). Nonetheless, the introduction of improved poultry breeds and biosecurity measures has the potential to enhance productivity and sustainability within the poultry production sector, significantly contributing to food security and supporting the nutritional status of the country's population (Davis and White, 2020). The poultry sector in the country is currently unable to meet local market demand effectively. According to the available report, the poultry products import rate followed the increasing trends of market demand in Afghanistan from 2003 to 2012 (World Bank, 2014). The import value of poultry products was estimated at 100 million dollars annually from neighboring countries and from distant countries such as Brazil and the USA in 2014 (Siddiky, 2017).

### BACKYARD POULTRY PRODUCTION

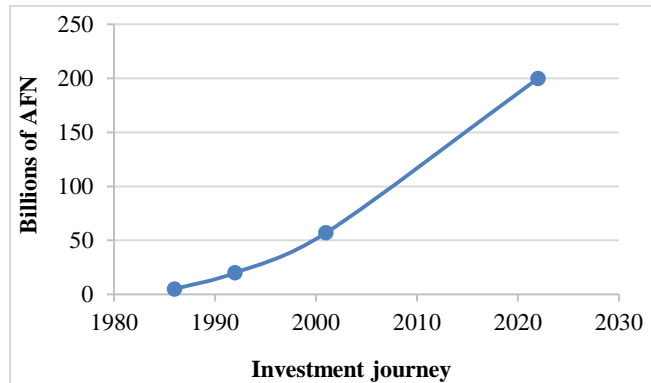
The indigenous chicken breeds, along with backyard production systems, play a crucial dynamic role in many rural, impoverished, and marginalized communities, providing both income and nutritional support through high-quality protein and essential amino acid sources (FAO, 2008). Additionally, poultry production practices provide nutritional support to families, offering always-available fresh eggs and meat, which are essential components of a balanced diet for children and the elderly

(Ramasawmy, 2017). In Afghanistan's challenging socio-economic context, backyard poultry production represents a valuable strategy for poverty alleviation and building resilience within communities. The backyard poultry production system primarily utilizes local indigenous chicken breeds such as Watani, Golden, and Naked neck, employing scavenging feeding practices with limited production potential. However, the free-range production system using traditional practices is associated with several constraints, including disease outbreaks, feed shortages, feed imbalances, inadequate housing, and ineffective management systems (Emal and Muhsni, 2017). The poultry flock size in a free-range rearing system is usually small and varies depending on the investment capability, infrastructure, and production facilities. In a study conducted in the Paghman district of Kabul province, Afghanistan, the flock size ranged from 3 to 50 chickens, with an average number of 26 chickens, and a mean of 117 eggs produced per flock per week, indicating an average of 65% egg production in the poultry backyard system (Nicnam MM and Ghafari, 2020). A study reported that out of 12.5 million poultry, chickens are under rearing practices across the country in Afghanistan; the majority (99%) were raised under the backyard poultry production system from 2002 to 2004, in which women played a significant role, with an average of 5.87 chickens owned per family (FAO, 2008; Samadi, 2025).

### COMMERCIAL POULTRY PRODUCTION

Commercial poultry production was initiated in Afghanistan when a new hybrid strain of chicken was introduced to the Badam Bagh farm in Kabul in 1963 (Hussain *et al.*, 2015). Thereafter, due to the country's conflicts, all the systems and strategies were demolished. However, over the last two decades, the poultry production sector has transitioned from a backyard to a more commercialized pattern, introducing remarkable developments. The poultry sector has expanded over time with increased investment and the establishment of additional broiler chicken and layer-rearing farms, hatcheries, and feed manufacturing units in Afghanistan (Zrawar *et al.*, 2023). The commercial poultry production sector employed approximately 82,000 people directly in 2018-2019 (Moore-Afghanistan, 2019). It is also reported that the poultry sector contributes 4.81% to agricultural growth and 9.84% to livestock sector growth. The investment rate in the poultry production sector tends to increase over time. The initial investment in the commercial poultry production system was estimated to be

5.0 billion AFN (71.42 million USD) in 1986, 20.0 billion AFN (285.71 million USD) in 1992, 57.0 billion AFN (814.3 million USD) in 2001 (Moore-Afghanistan, 2019), and 200 billion AFN (2.85 billion USD) in 2022 (Khatami et al., 2022). The investment background in the poultry sector is illustrated in Figure 1.



**Figure 1.** Investment trend in the poultry production sector in Afghanistan in local currency (Afghanis) during 1980-2025.

A total of 8,910 broiler chicken and 982-layer farms were actively operating across the country in 2015, in which about 56,155,778 chickens were estimated to be under rearing practices (CARD-F, 2016). The recent report indicated that a total of 11,000 broiler chicken and 233 layer poultry farms, 20 units of feed manufacturing plants, 28 units of hatcheries, and nine units of poultry meat processing plants are actively operating across the country in the poultry sector (Moore-Afghanistan, 2019). However, despite substantial investments in domestic poultry production, market demand remains unmet. The poultry sector was projected to meet approximately 70% of the country's meat and egg demand by 2024-2025, with an annual growth rate of 9-10% (CARD-F, 2016; Khatami et al., 2022). Comprehensive Agriculture and Rural Development-Facility (CARD-F) reported through an assessment that the market demand for poultry meat was 173,000 MT (11,529,276 chickens) per year in 2015 across Afghanistan. In contrast, Moore-Afghanistan (2019) reported a demand of 270,000 MT and 1.05 billion for poultry meat and eggs, respectively, in 2019, which was 57% higher than the estimate reported in 2015. The poultry meat production in the country was reported as 182,000 MT, and the total capacity was estimated to be 232,000 MT annually (Moore-Afghanistan, 2019), demonstrating the poultry sector's contribution of 67.4% to the overall poultry meat demand market. The future demand for poultry meat in the country was projected to cross 232,950 MT in 2024 (Moore-Afghanistan, 2019).

However, the recent production rate reported by MAIL (World Bank, 2016) of 219,000 MT was close to the value projected by CAED-F (CARD-F, 2016), whereas the total market demand was estimated to be 295,000 MT in 2024. Hence, the current production capacity can cover 74% of the country's poultry meat market demand, which is above the estimated 67.4% potential reported by Moore-Afghanistan (2019). It was reported that the poultry meat contribution to the total meat market in Afghanistan was 19% in 2018 and increased to 25.8% in 2022 (Khatami et al., 2022). The increasing demand for poultry meat is attributed to different factors, such as an improved economy, urbanization (WHO, 2020), reduced access to other animal protein sources, and a 2.7% annual human population growth in the country (World Bank, 2023). The total number of chickens under rearing practices, egg production, fertile eggs, day-old chicks (DoC), feed produced, market demand, and deficiency in number rate during 2014-2015 is presented in Table 1. The value of imported poultry meat increased from 1183 million AFN (16.9 million USD) to 5940 million AFN (85 million USD) from 2008 to 2012, while the value of imported eggs increased from 1225 million AFN (17.5 million USD) to 2072 million AFN (29.6 million USD; World Bank, 2023). The value of imported meat and eggs was reported to increase further to 183 USD million and 38 million USD, respectively, in 2019 (Moore-Afghanistan, 2019).

**Table 1.** Poultry under rearing practices, egg and day-old chickens' production, demand, and deficiency during 2014-2015, in Afghanistan

| Component<br>(Number/10,000) | National<br>production | National<br>demand | Deficiency |
|------------------------------|------------------------|--------------------|------------|
| Broiler chickens             | 561.6                  | 1,150.8            | 589.2      |
| Table eggs                   | 1,908.7                | 10,622.7           | 8,714.0    |
| DoCs – broilers              | 122.4                  | 1,211.4            | 1,089.0    |
| DoCs -female layers          | 5.3                    | 62.1               | 56.8       |
| Fertile eggs -broiler        | 66.8                   | 1,275.1            | 1,208.3    |
| Fertile eggs - layer         | 5.8                    | 130.8              | 125.0      |
| Poultry feed- MT             | 1.3                    | 6.7                | 5.4        |
| Total fertile eggs           | 72.6                   | 1,405.9            | 1,333.3    |
| Total DoCs                   | 127.7                  | 1,273.5            | 1,145.8    |

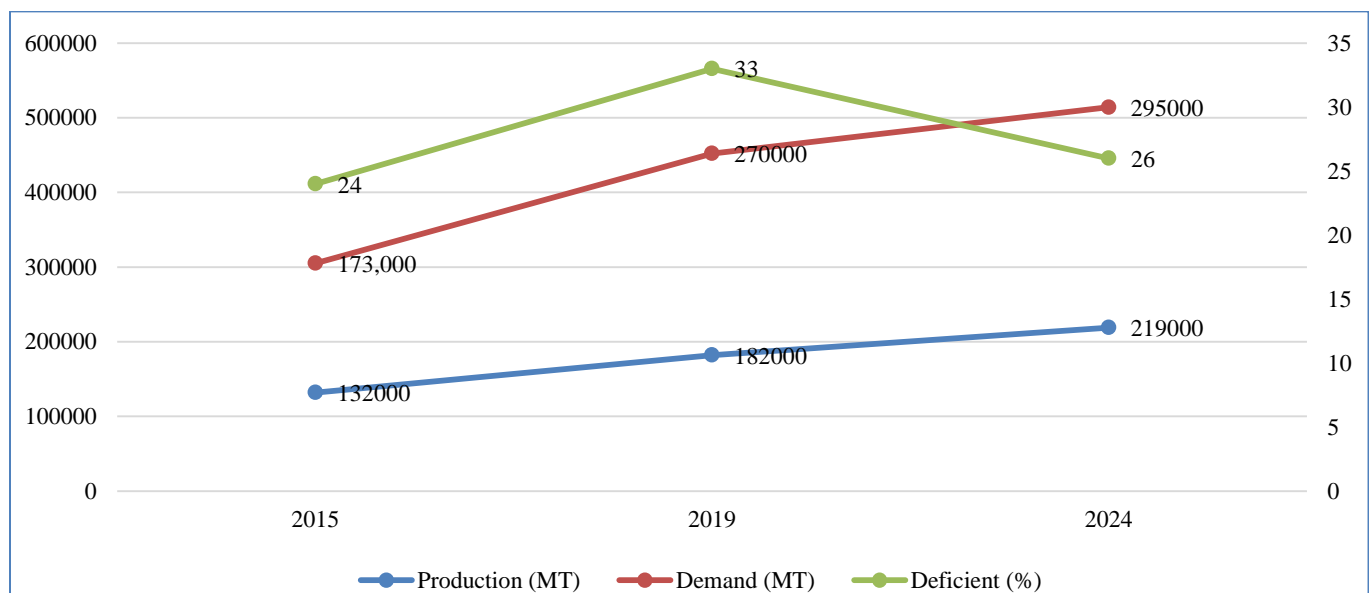
Source: CARD-F (2016). DoCs: Day-old chicks, MT: Metric ton.

Despite the poultry production sector shifting from a backyard system to commercialization, as well as an increase in imported meat quantity over recent years, the availability of poultry meat and eggs per capita remains

deficient in Afghanistan. However, the average consumption of poultry meat is different among countries and nations. The global average consumption of poultry meat was estimated at 13.6 kg per capita, ranging from 1.77 kg in India to 43.81 kg in the United States in 2014 (Vaarst *et al.*, 2015). In 2013, the average annual poultry meat and egg availability per capita in Pakistan was reported as 5 kg and 51 eggs, respectively (Hussain *et al.*, 2015). In 2018, the average annual poultry meat consumption per capita in Afghanistan was reported to range from 8.79 kg to 6.5 kg (CARD-F, 2016; Our World in Data, 2018). The global meat consumption per capita was reported at 34.3 kg, of which poultry meat contributes 13.84 kg and is expected to increase to 14.69 kg by 2027 (Efremova, 2019). The data indicated that poultry meat could account for approximately 36% of the global meat market. According to the established WHO recommendation, a total of 27 g of protein per day per capita, equivalent to 102.3 g of fresh meat, is required to meet the optimum protein requirement in the human body (Hussain *et al.*, 2015). Given Afghanistan's human population of 35 million, the total meat requirement was estimated at 1.306 million MT, of which 36% (470,477 MT) was derived from poultry meat (Bruinsma, 2017). The current poultry production in Afghanistan is estimated at 219,000 MT (MAIL, 2024), which can meet only 46.5% of the WHO-recommended standard requirement. Similar

data was presented by CARD-F (2016) and Moore-Afghanistan (2019) about poultry meat production in Afghanistan. Considering the poultry meat's contribution to the total meat market as 18.3% (FAO, 2024), the current poultry meat requirement can be calculated as 239,000 MT. In contrast, the total production reported by MAIL (MAIL, 2024) was 219,000 MT, which covered 92% of the country's requirement. No data is currently available regarding the value of poultry meat imports from the international market. The production level, market demand, and deficiency of poultry meat in Afghanistan are illustrated in Figure 2.

The available data on meat consumption per capita in Afghanistan varies. The FAO (2024) reported that the total annual meat consumption per capita in Afghanistan was 9.3 kg, out of which 1.7 kg is contributed from poultry meat. The data indicated that poultry meat occupies only 18.3% of total meat consumption. The availability of animal-origin protein in Afghanistan, per capita per day, was estimated at 10.2 g, while in Pakistan, the value was reported as 29.5 g, and in the USA, it was found to be 84.3 g (FAO, 2024). The majority of this protein can be sourced from meat, with a minor portion coming from eggs and milk. Therefore, the recommended consumption of red meat per capita would not be more than 98 g per week (WHO, 2023).



**Figure 2.** Production level, demand, and deficiency rate of poultry meat in Afghanistan from 2015 to 2019.

The primary challenge of the present study was the scarcity of reliable data on egg production and consumption in Afghanistan. However, the average egg

consumption per capita was reported to be 40 (number) per year (CARD-F, 2016), while this value in Pakistan was reported to be 70-80 eggs per capita. The volume imported



of eggs was reported as 812 million (in number) during the period of 2018-2019 (Moore-Afghanistan, 2019).

## CHALLENGES

The poultry sector in Afghanistan is facing multiple challenges that hinder its development. The lack of sufficient literature and data on sectoral challenges poses a problem in preparing the current study. However, practical experience and observations from the field activities were minimally used here to enrich the study.

### Traditional management practices

For preventing different infectious disease outbreaks, biosecurity practice is the most effective, economical, and applicable measure (Subasinghe et al., 2023). Despite this improvement, poultry raising practices in Afghanistan remain traditional, characterized by low management skills and limited knowledge, as reported by Abozar et al. (2021) and Samadi and Zadran (2023). The situation could directly affect poultry raising management, production performance, and the farming economy. A study conducted in Kabul province, Afghanistan, found that the majority of farmers were uneducated, and the biosecurity practices in most (50-70%) of the farming areas were evaluated as poor or very poor. According to the same report, approximately 27.66% of farmers have not implemented disinfection procedures for biosecurity. This lack of practice contributes to disease outbreaks, poor growth performance, higher mortality rates, and a weakened farming economy in poultry. The study conducted by Khatami et al. (2022) reported a higher mortality rate (11-20%) and economic losses during farming production cycles due to disease outbreaks, such as Newcastle disease, infectious bronchitis, and colibacillosis, as well as market price fluctuations in Afghanistan. This situation automatically leads to farmers' poor satisfaction with the farm's production performance (54%; Shaiq et al., 2024). Nonetheless, Faizy et al. (2022) and Samadi and Zadran (2023) have documented that poultry farms implement medium- to high-level biosecurity protocols, with approximately 98% engaging in vaccination practices, as evidenced throughout Kabul Province, Afghanistan. Additionally, Samadi and Zadran (2023) reported poor management practices, inadequate infrastructure, and suboptimal biosecurity measures in poultry farms in Kabul Province. Poor sanitation practices can have detrimental effects on meat and egg quality, potentially leading to the presence of foodborne pathogens such as *Clostridium perfringens*, *Salmonella enterica*, and

*Escherichia coli*, which significantly impact the poultry production sector in Afghanistan (Shaiq et al., 2024).

### Poor infrastructure

The farm infrastructure plays a significant role in biosecurity and management practices, which can directly impact farm production performance and economy. Proper management and poultry welfare can be practiced only in a well-standardized infrastructure. Poor ventilation, which causes several health problems in poultry farms, has been reported in many farming systems due to inadequate infrastructure (Shaiq et al., 2024). Poor infrastructure was evident in several observations within the poultry production sector in Afghanistan (Nicnam and Ghafari, 2020). The poor infrastructure could directly impact the standardization of management in the farming system. A study conducted in Kabul province, Afghanistan, indicated that inappropriate farm structure and location lead to poor biosecurity measures, access of wild birds, availability of rodents, wild animals such as cats and dogs interfering with the red zone, and feed spoilage due to inappropriate storage and preservation in farming systems (Samadi and Zadran, 2023).

### Lack of technical expertise

Field observations and practical experiences for the present study indicated that the poultry production sector was notably constrained by a lack of technical expertise, resulting in inadequate or poor-quality veterinary services, ineffective consultation, frequent disease outbreaks, and increased mortality rates. Consequently, these challenges contribute to higher veterinary input costs and negatively impact the overall economic viability of poultry farming. A study conducted in Baghlan province, Afghanistan, demonstrated that a lack of technical expertise, farmers' lower educational levels, poor ventilation provision, and local residency were recognized as highly important factors affecting farm development and sustainability (Shaiq et al., 2024). Zrawar et al. (2023) suggested that poor experience and low educational levels may be contributing factors to poor farming performance among farmers. The lack of testing laboratory facilities and diagnostic techniques contributes to the disease maintaining its epidemic flow.

### Diseases outbreaks

According to the available literature and field experience, poultry diseases are the primary and most frequently occurring factor that severely hinders sector development in Afghanistan (Leslie et al., 2008; Sahab et

al., 2020; Kariithi *et al.*, 2021). Several reports indicated that some factors, such as rodents, wild birds, and poor biosecurity, are the key players contributing to infectious and zoonotic disease outbreaks among poultry and animals that can contaminate water and feed resources in farming systems (Meerburg and Kijlstra, 2007; Backhans and Fellström, 2012; Samadi and Zadran, 2023). Based on the clinical experiences and direct observations from the field during the present study, the frequently occurring viral diseases were infectious bursal disease, infectious bronchitis, Newcastle disease, and infectious laryngotracheitis. Bacterial infections, such as Colibacillosis, Salmonellosis, Enterobacteriosis, and Campylobacteriosis, commonly occur in broiler farms. *Mycoplasma* infections, such as chronic respiratory disease (CRD) and coccidiosis, are also primary and clinically important diseases (Sangary and Mohmand, 2020; Bawer *et al.*, 2025). All the diseases could maintain their epidemiological status for a long period and significantly affect farming performance.

#### Uncontrolled use of antimicrobial agents

Antimicrobials are primarily used for therapeutic purposes, as well as at subtherapeutic doses, as growth-promoting agents in the livestock and poultry production sector (Azizi *et al.*, 2024; Aminullah *et al.*, 2025). The continuous and uncontrolled use of antibiotics, particularly as growth-promoting agents, results in the development of antimicrobial resistance, which poses significant risks to both animal and human health (Mulchandani *et al.*, 2023; Aminullah *et al.*, 2025). A study conducted in 2024 by Danish (2024) evaluated antibiotic use in commercial broiler chicken farms in Kandahar Province, Afghanistan. Danish (2024) demonstrated that a total of 19 types of antibiotics are used in commercial poultry farms for three primary purposes, including disease treatment, prevention, and growth promotion in broiler chickens. The antibiotics that were most commonly used were colistin (78%), amoxicillin (97%), tylosin (83%), and enrofloxacin (100%). Additionally, Danish (2024) reported a total of 4.2 g of antibiotics per chicken from day one to market supply, without consulting a veterinary expert. This phenomenon can lead to the development of microbial-resistant strains, posing another challenge in the poultry production sector. Evidence from clinical experience during the present study demonstrated that most antibiotics at the established recommended dosage were insufficient to control the bacterial infection, indicating microbial resistance. Apart from antimicrobials, the use of minerals as growth promoters, such as copper, in large quantities in

poultry production and their excretion, which is highly toxic, poses another global challenge to animal and human health and to the environment (Aminullah *et al.*, 2022; 2023; Noor *et al.*, 2023).

#### Quality issues in feed and veterinary products

The quality of poultry feed and veterinary products in Afghanistan has been a significant concern, adversely impacting the poultry production sector. Inadequate regulations and limited access to high-quality, certified ingredient sources have led to substandard feed formulations, compromising poultry productivity (Faizy *et al.*, 2022). The challenge of poultry feed and veterinary products quality in Afghanistan was reported through an importance-performance analysis study conducted in Baghlan province, Afghanistan (Abozar *et al.*, 2021). Additionally, the improper and unsafe storage of feed and feed ingredients leads to fungal infestation and mycotoxin production (Ochieng *et al.*, 2021). Poor-quality veterinary input can further exacerbate the situation, leading to inappropriate treatments, increased disease susceptibility, and reduced productivity of the chickens (Sherman, 2005). The unavailability of technical experts, research and testing laboratories, and infrastructure are challenging factors that influence the quality evaluation of feed, as well as medicines and vaccines. A study conducted by Abozar *et al.* (2021) in Kunduz, Afghanistan, revealed significantly lower productive performance in hens fed a diet produced by local companies compared to those fed imported diets from international markets.

#### Price variations of final products

Poultry products, particularly meat, are highly susceptible to market price fluctuations compared to other commodities and agricultural products. Factors such as fluctuations in poultry production, seasonal and climatic variations, and human behaviors may account for the fluctuations observed in market prices (Upton, 2007). For instance, the price of DoC during the hot season, from May to August, is the lowest. During these months, the environmental temperature in Afghanistan is higher, particularly in the western and southern regions of the country. The environmental temperature in the southern region from May to August ranges from 40 to 48 °C, which is extremely hot and can significantly affect the poultry production performance (Wasti *et al.*, 2020). During May to August, an increase in the outbreak of infectious diseases leads to higher mortality rates among chickens, while the demand for poultry meat in the market has also decreased. In the central, eastern, and northern

regions of Afghanistan, the cold season typically begins in September and lasts until May. During the cold months, particularly in winter, chicken brooding costs increase due to the need for farm temperature maintenance, resulting in reduced poultry production levels. The increased production cost may be attributed to the lack of or unavailability of energy sources to maintain the farms' temperature at an optimum level. Other factors include variations in the poultry meat consumption ratio compared to other meats, which depend on seasonal and social behaviors, as well as insufficient domestic supply and reliance on the international market, which can lead to price variations in the poultry meat market. The Pakistani market plays a significant role in the poultry market in Afghanistan, which is also prone to seasonal price fluctuations (Hussain et al., 2015); therefore, these variations directly impact poultry market prices in Afghanistan.

#### **Farming production performance**

Poultry farming production performance can be influenced by different factors, including management style, animal welfare, nutrition, and technology (Ben Sassi et al., 2016). There is no reputable published literature available to address the most predominant factors and their impact on poultry farming. A study conducted by Zrawar et al. (2023) in Parwan Province, Afghanistan, reported a feed conversion ratio of 1.83, with 90.23% livability, an average market weight of 1.9 kg, and a mortality rate of 9.77%. From the production economy perspective, feed, DoC, and veterinary services expenses accounted for 70.45%, 6.98%, and 3.44%, respectively, of the total production cost (Zrawar et al., 2023). The cost-benefit ratio was reported to be 1:0.07, while Samadi and Zadran (2023) reported a value of 1:0.48.

#### **FUTURE PROSPECTS**

The demand for animal-origin protein is increasing, driving rapid growth in the global agriculture sector. It has been indicated that demand is shifting from red to white sources (lower cholesterol), such as poultry meat (Our World in Data, 2018). On the other hand, poultry production is a result of the expansion of fast-food chains, consumer preferences, competitiveness, and concerns over the safety of red meat (Charles, 2013). Globally, the religious motivation for consuming poultry meat is another factor driving higher demand in the market. The increasing demand for poultry products (Meat and eggs) in Afghanistan was being regulated by the growing

population (World Bank, 2023), rising household incomes, and urbanization (WHO, 2020). This increased demand for poultry products was attributed to the rising trend, from an initial investment of 5.0 billion AFN (71.42 million USD) in 1986 to 200 billion AFN (2.85 billion USD) in 2022 (Khatami et al., 2022). According to the World Bank (2023), the Afghan human population is growing at a rate of 2.7% per year, while the poultry sector was estimated to grow between 15% and 20% (Hafez and Attia, 2020). Another study reported a 400% increase in poultry growth rate from 1990 to 2019, with an average annual growth rate of 13.8% (OECD, 2017). As the current poultry meat production was reported to be 219,000 MT (MAIL, 2024), with an average annual growth rate of 13.8%, the projected production was calculated to be 400,332 MT by 2030.

Field studies and lectures indicated that Afghanistan has potential sources for poultry production, such as natural resources and growing demand for poultry products within its borders (Samadi, 2025). As Afghanistan continues to navigate its socio-economic challenges, the poultry sector presents an opportunity to enhance food security, generate employment opportunities, play a crucial role in the national economy, and foster rural development (Wong et al., 2017). In the current context of the country, particularly for the poultry backyard system in both rural and urban areas, poultry is a major asset and key to providing food security, economic income, poverty alleviation, and market participation (Mottet and Tempio, 2017). Furthermore, Afghanistan's diverse climate and agricultural landscape provided suitable conditions for poultry farming. The country's vast rural areas are conducive to both small-scale and commercial poultry operations (Samadi, 2025). The available resources not only preserve local biodiversity but also empower farmers through improved methodology practices and quality services. Investment in education and training for farmers is critical to the success of the poultry production sector.

In addition, collaboration with international organizations and agricultural experts can facilitate the transfer of knowledge and improved access to high-quality feed and veterinary services (Sennuga et al., 2022). A similar strategy can also be adopted in the Afghan circumstance. With the right investments in infrastructure and technology, the poultry industry not only meets national market demand but also can be exported to neighboring countries. By aligning investment strategies with local requirements and establishing a robust support system for farmers,



Afghanistan can transform its poultry industry into a sustainable source of nutrition and economic opportunity (Azizi, 2024). The adoption of modern feed strategies, including postbiotics and par-probiotics, could further improve poultry health and productivity (Danladi *et al.*, 2022a, 2022b). As Afghanistan strives for stability and prosperity, the advancement of poultry production stands out as a pivotal component of its agricultural strategy, as revealed by the Afghanistan National Development Strategy (ANDS, 2005). The development of the poultry sector has a significant impact on the environment and is a large consumer of natural resources.

## CONCLUSION

The present study is among the first to comprehensively document and contextualize the poultry production sector in Afghanistan, providing an evidence-based study of its current status, key challenges, and potential future opportunities. The demand for poultry products in Afghanistan continues to increase, primarily due to factors such as economic growth and urbanization. The investment rate in the commercial poultry production system was estimated as 200 billion AFN (2.85 billion USD) in 2022. There are over 11,000 broiler poultry farms actively operating across the country, supplying approximately 219,000 MT of meat to the market, while the total demand was estimated at 295,000 MT in 2024. The available consumption per capita in Afghanistan is estimated to be 6.5 kg, which meets only 46% of the WHO recommendations. Different factors, including traditional management practices, inadequate infrastructure, a lack of technical expertise, disease outbreaks, misuse of antimicrobials, poor-quality veterinary input, and fluctuating end-product prices, hinder the sector's development and production performance. Strengthening the poultry sector with modern technologies and professional farming practices is essential for building long-term resilience in Afghanistan. With strategic interventions, the country has the potential to achieve an estimated poultry meat production capacity of 400,332 MT by 2030. Moreover, enhancing farmers' capacities in key aspects such as biosecurity, nutrition, and veterinary management plays a critical role in minimizing disease outbreaks and improving overall production efficiency. Future investigations should focus on refining knowledge of production dynamics, health management practices, and market performance across Afghanistan's poultry industry.

## DECLARATIONS

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### Authors' contributions

Aminullah Noor and Mohammad Naeem Azizi conceptualized and drafted the study. Aminullah Noor, Mohammad Naeem Azizi, Mohammad Dawood Bawer, Obaidullah Mahaq, and Mahboobullah Ahmadi contributed to the review and editing of the manuscript. All authors reviewed and approved the final edition of the manuscript.

### Competing of interests

The authors declared no conflicts of interest.

### Ethical considerations

Ethical issues, including plagiarism, consent to publish, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancy, have been checked by all the authors. The authors confirmed they have not assisted the AI in conducting the present study.

### Availability of data and materials

No new data were generated or analyzed in the present study. All information presented was based on previously published sources, which are cited accordingly.

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## REFERENCES

- Abozar F, Himat AM, Nazari ZA, Zafari N, and Hamdard E (2021). Comparative study of foreign and domestic feeds and their effects on eggs production in golden breed in Baghlan province of Afghanistan. *Asian Journal of Research in Animal and Veterinary Sciences*, 4(1): 52-65. DOI: <https://www.doi.org/10.9734/ajrav/2021/v4i1116>
- Aminullah N, Mostamand A, Zahir A, Mahaq O, and Azizi MN (2025). Phytogetic feed additives as alternatives to antibiotics in poultry production: A review. *Veterinary World*, 18(1): 141-154. DOI: <https://www.doi.org/10.14202/vetworld.2025.141-154>
- Aminullah N, Prabhu TM, Suresh BN, and Mostamand A (2023). Nano copper in poultry nutrition: Potential effect and future prospect-A review. *Indian Journal of Animal Nutrition*, 39(4): 332-344. DOI: <https://www.doi.org/10.5958/2231-6744.2022.00040.8>

- Aminullah N, Prabhu TM, Naik J, Suresh BN, Chikkaramappa T, and Umashankar BC (2022). Effect of organic and nano forms of copper at reduced dietary levels on excretion and tissue deposition of selected minerals in Giriraja chicken. *Animal Nutrition and Feed Technology*, 22(3): 489-502. DOI: <https://www.doi.org/10.5958/0974-181X.2022.00039.7>
- Afghanistan national development strategy (ANDS) (2005). Afghanistan national development strategy. An interim strategy for security, governance, economic growth & poverty reduction. Volume I, pp. 1-234. Available at: <https://mof.gov.af/sites/default/files/2021-05/ANDS.pdf>
- Azizi MN (2024). Constraints of livestock sector development and low economic contribution to the economy of Afghanistan. *Journal of Natural Science Review*, 141: 593-606. DOI: <https://www.doi.org/10.62810/jnsr.v2iSpecial.Issue.161>
- Azizi MN, Loh TC, Foo HL, and Chung ELT (2021). Is palm kernel cake a suitable alternative feed ingredient for poultry?. *Animals*, 11(2): 338. DOI: <https://www.doi.org/10.3390/ani11020338>
- Azizi MN, Zahir A, Mahaq O, and Aminullah N (2024). The alternatives of antibiotics in poultry production for reducing antimicrobial resistance. *World's Veterinary Journal*, 14(2): 270-283. DOI: <https://www.doi.org/10.54203/scil.2024.vwj34>
- Backhans A and Fellström C (2012). Rodents on pig and chicken farms – A potential threat to human and animal health. *Infection Ecology and Epidemiology*, 2(1): 17093. DOI: <https://www.doi.org/10.3402/iee.v2i0.17093>
- Bawer MD, Danish F, Ahmadi M, Azizi MN, Mamatha GS, PuttalaKshamma GC, and Kumar GSN (2025). Molecular identification of *Eimeria* species in desi chickens using ITS-1 rDNA PCR analysis. *World's Veterinary Journal*, 15(2): 315-326. DOI: <https://www.doi.org/10.54203/scil.2025.vwj34>
- Ben Sassi N, Averós X, and Estevez I (2016). Technology and poultry welfare. *Animals*, 6(10): 62. DOI: <https://www.doi.org/10.3390/ani6100062>
- Berners-Lee M, Kennelly C, Watson R, and Hewitt CN (2018). Current global food production is sufficient to meet human nutritional needs in 2050 provided there is radical societal adaptation. *Elementa Scientific of Anthropolent*, 6: 52. DOI: <https://www.doi.org/10.1525/elementa.310>
- Bist RB, Bist K, Poudel S, Subedi D, Yang X, Paneru B, and Chai L (2024). Sustainable poultry farming practices: A critical review of current strategies and future prospects. *Poultry Science*, 103(12): 104295. DOI: <https://www.doi.org/10.1016/j.psj.2024.104295>
- Bruinsma J (2017). *World agriculture: Towards 2015/2030: A FAO study*. Routledge, pp. 1-61. DOI: <https://www.doi.org/10.4324/9781315083858>
- Comprehensive agriculture and rural development-facility (CARD-F) (2016). Comprehensive agriculture and rural development-facility, Ministry of Agriculture, Irrigation and Livestock, assessment of the poultry value chain with a proposed vision for growth in Afghanistan.
- Charles MW (2013). Location, siting and concentration of poultry units. *Poultry development review. Poultry waste management in developing countries*. FAO, pp. 1-127. Available at: <https://www.fao.org/4/i3531e/i3531e.pdf>
- Danish FA (2024). Study of antibiotic usage at commercial broiler chicken farms in Kandahar province. *Academic Research Dissertation*. Afghanistan National Agriculture and Technology University, pp. 1-10.
- Danladi Y, Loh TC, Foo HL, Akit H, Tamrin NAM, and Azizi MN (2022a). Effects of postbiotics and paraprobiotics as replacements for antibiotics on growth performance, carcass characteristics, small intestine histomorphology, immune status and hepatic growth gene expression in broiler chickens. *Animals* 12(7): 917. DOI: <https://www.doi.org/10.3390/ani12070917>
- Danladi Y, Loh TC, Foo HL, Akit H, Tamrin NAM, and Naeem AM (2022b). Impact of feeding postbiotics and paraprobiotics produced from *Lactiplantibacillus plantarum* on colon mucosa microbiota in broiler chickens. *Frontiers in Veterinary Science* 9: 859284. DOI: <https://www.doi.org/10.3389/fvets.2022.859284>
- Davis TC and White RR (2020). Breeding animals to feed people: The many roles of animal reproduction in ensuring global food security. *Theriogenology*, 150: 27-33. DOI: <https://www.doi.org/10.1016/j.theriogenology.2020.01.041>
- Efremova A (2019). Poultry industry: Current state and role in the global meat market. 3<sup>rd</sup> International conference on food and agricultural economics: Poultry industry: Current state and role in the global meat market, pp. 70-77. Available at: <https://ageconsearch.umn.edu/record/296773?ln=en&v=pdf>
- Emal J and Muhsni AM (2017). Backyard poultry production system in Afghanistan. backyard poultry production systems in SAARC member State, pp. 2-120. Available at: [Backyard Poultry.pdf](https://www.doi.org/10.3390/ani11020338)
- Faizy H, Azimi A, Alam S, Safari ZS, and Atif A (2022). Food safety status on poultry meat and egg in Afghanistan. *Agro Tech-Food Science, Technology and Environment*, 1(1): 57-60. DOI: <https://www.doi.org/10.53797/AGROTECH.V1I1.8.2022>
- Food and agriculture organization of the United Nations (FAO) (2008). Afghanistan national livestock census 2002-2003. OSRO/AFG/212/AFG final report. Food and Agriculture Organization of the United Nations, Rome. Available at: [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.fao.org/fileadmin/templates/ess/ess\\_test\\_folder/World\\_Census\\_Agriculture/Country\\_info\\_2000/Reports\\_2/AFG\\_ENG\\_REP\\_2003\\_01.pdf](https://www.fao.org/fileadmin/templates/ess/ess_test_folder/World_Census_Agriculture/Country_info_2000/Reports_2/AFG_ENG_REP_2003_01.pdf)
- Food and agriculture organization of the United Nations (FAO) (2023). FAOSTAT database. Available at: <https://www.fao.org/faostat/en/#country/20>
- Food and agriculture organization of the United Nations (FAO) (2024). FAOSTAT database. Available at: <https://www.fao.org/faostat/en/#country/2>
- Farrell D (2013). The role of poultry in human nutrition. *Poultry development review. Food and Agriculture Organization*, Rome, pp. 2-9. Available at: <https://openknowledge.fao.org/server/api/core/bitstreams/8506e61a-14f5-4df6-9f2c-8aafa25e9570/content>
- Hafez HM and Attia YA (2020). Challenges to the poultry industry: Current perspectives and strategic future after the COVID-19 outbreak. *Frontiers in Veterinary Science*, 7: 516. DOI: <https://www.doi.org/10.3389/fvets.2020.00516>
- Hussain J, Rabbani I, Aslam S, and Ahmad H A (2015). An overview of poultry industry in Pakistan. *World's Poultry Science Journal*, 71(4): 689-700. DOI: <https://www.doi.org/10.1017/S0043933915002366>
- Kariithi HM, Ferreira HL, Welch CN, Ateya LO, Apopo AA, Zoller R, Volkening JD, Williams-Coplin D, Parris DJ, Olivier TM et al. (2021). Surveillance and genetic characterization of virulent Newcastle disease virus subgenotype V. 3 in indigenous chickens from backyard poultry farms and live bird markets in Kenya. *Viruses*, 13(1): 103. DOI: <https://www.doi.org/10.3390/v13010103>
- Khatami S, Azimi AM, and Hewadmal N (2022). Analysis of the economic situation of poultry production in Badghis Province. *The Journal of Academic Social Science*, 10(126): 235-254. Available at: [https://asosjournal.com/?mod=makale\\_tr\\_ozet&makale\\_id=57517](https://asosjournal.com/?mod=makale_tr_ozet&makale_id=57517)
- Leslie T, Billaud J, Mofleh J, Mustafa L, and Yingst S (2008). Knowledge, attitudes, and practices regarding avian influenza (H5N1), Afghanistan. *Emerging Infectious Diseases*, 14: 1459-1461. DOI: <https://www.doi.org/10.3201/eid1409.071382>
- Ministry of agriculture, irrigation, and livestock (MAIL) (2024). Ministry of Agriculture, Irrigation and Livestock. Islamic Imaret of

- Afghanistan. Available at: <https://www.mail.gov.af/index.php/en/node/1371>
- Meerburg GB and Kijlstra A (2007). Review role of rodents in transmission of *Salmonella* and *Campylobacter*. *Journal of the Science Food and Agriculture*, 87(15): 2774-2781. DOI: <https://www.doi.org/10.1002/jsfa.3004>
- Memon M, Khan K, Parvez A, Shaikh S, and Khan K (2021). Economic viability of poultry farmers in Pakistan: A case study of district Mardan. *Khyber Pakhtunkhwa. Journal of Innovate Science*, 7(1): 142-151. DOI: <https://www.doi.org/10.17582/journal.jis/2021/7.1.142.151>
- Moore-Afghanistan (2019). Afghanistan poultry industry. Available at: <10-Afghanistan-Poultry-Industry.pdf>
- Mottet A and Tempio G (2017). Global poultry production: Current state and future outlook and challenges. *World's Poultry Science Journal*, 73(2): 245-256. DOI: <https://www.doi.org/10.1017/S0043933917000071>
- Mulchandani R, Wang Y, Gilbert M, and Van Boeckel TP (2023). Global trends in antimicrobial use in food-producing animals: 2020 to 2030. *PLOS Glob Public Health*, 3(2): e0001305. DOI: <https://www.doi.org/10.1371/journal.pgph.0001305>
- Muradi AJ and Boz I (2018). The contribution of agriculture sector in the economy of Afghanistan. *International Journal of Scientific Research and Management*, 6(10): 750-755. DOI: <https://www.doi.org/10.18535/ijrm/v6i10.em04>
- Nicnam MM and Ghafari SR (2020). Socio-economic factors affecting the role of women in family poultry production: A case study at Paghman district, Kabul province, Afghanistan. *e-planet*, 18(1): 39-46. Available at: <https://e-planet.co.in/images/Publication/vol-18-1/socio-economic.pdf>
- Noor A, Prabhu TM, Suresh BN, Zahir A, Sudharshan S, and Azizi MN (2023). Carcass, bone and meat quality characteristics of Giriraja chicken fed reduced levels of organic and nano copper supplemented diets. *Indian Journal of Animal Nutrition*, 40(3): 337-346. DOI: <https://www.doi.org/10.5958/2231-6744.2023.00042.7>
- Ochieng PE, Scippo ML, Kemboi DC, Croubels S, Okoth S, Kang'ethe EK, Doupovec B, Gathumbi JK, Lindahl JF, Kang'ethe EK et al. (2021). Mycotoxins in poultry feed and feed ingredients from Sub-Saharan Africa and their impact on the production of broiler and layer chickens: A review. *Toxins*, 13(9): 633. DOI: <https://www.doi.org/10.3390/toxins13090633>
- Organisation for economic co-operation and development (OECD) (2017). OECD-FAO agricultural outlook 2017-2026. ERCD-FAO agricultural outlook. Rome, Italy. Available at: Amiable at: <OECD-FAO Agricultural Outlook 2017-2026 | OECD>
- Our world in data (2018). Meat consumption vs. GDP per capita, Average meat consumption per capita, measured in kilograms per year versus gross domestic product. Available at: <https://ourworldindata.org/grapher/meat-consumption-vs-gdp-per-capita?tab=table&time=2018>
- Ramasawmy MR (2017). Do chickens dream only of grain? Uncovering the social role of poultry in Ethiopia. Doctoral dissertation, University of Roehampton, Ethiopia. Available at: <Melanie Ramasawmy Thesis.pdf>
- Ritchie H, Rosado P, and Roser M (2023). Meat and dairy production. Our world in data. Available at: <Meat and Dairy Production - Our World in Data>
- Sahab MN, Mirzad AN, Miakhil A, and Amin MA (2020). Investigation of poultry diseases outbreak in different seasons in Shulgara district of Balkh province. *International Journal of Advanced Academic Studies*, 2(4): 85-88. DOI: <https://www.doi.org/10.33545/27068919.2020.v2.i4b.335>
- Sangary M and Mohmand W (2024). Prevalence of common diseases in Kabul city broiler chicken farms through the evaluation of macroscopic pathological changes. *Journal of Natural Science* Review, 2(4): 36-47. DOI: <https://www.doi.org/10.62810/jnsr.v2i4.102>
- Sahota AW and Bhatti BM (2003a). Productive performance of desi field chickens as affected under deep litter system. *Pakistan Journal of Veterinary Research*, 1(1): 35-38. Available at: <Productive performance of desi field chickens as affected under deep litter system>
- Sahota AW and Bhatti BM (2003b). Growth performance of different varieties of Desi generation-1 chickens maintained under deep litter system. *Pakistan Journal of Veterinary Research*, 1(1): 46-49. Available at: <https://www.cabidigitallibrary.org/doi/full/10.5555/20033132078>
- Samadi A (2025). Opportunities and challenges to Afghanistan's self-sufficiency in livestock production sector. *Journal of Natural Science* Review, 3(2): 1-17. DOI: <https://www.doi.org/10.62810/jnsr.v3i2.224>
- Samadi A and Zadrán N (2023). Evaluation of practiced biosecurity measures in selected broiler farms across Kabul Province, Afghanistan. *Journal of Advanced Veterinary Research*, 13(2): 246-251. Available at: <https://www.advetresearch.com/index.php/AVR/article/view/1208/678>
- Sennuga SO, Lai-Solarin WI, Adeoye WA, and Alabuja FO (2022). Extension's role in improving livestock production: Information needs, institutions and opportunities. *International Journal of Agriculture and Nutrition*, 4: 43-51. DOI: <https://www.doi.org/10.33545/26646064.2022.v4.i2a.80>
- Shaiq MA, Naiemi M, Razavi K, and Hamidi SAA (2024). Importance-performance analysis of factors affecting the sustainability and development of poultry farms (evidence from broiler farms in Baghlan province, Afghanistan). *Journal for Research in Applied Sciences and Biotechnology*, 3(5): 51-85. DOI: <https://www.doi.org/10.55544/jrasb.3.5.9>
- Sherman DM (2005). Priority needs for veterinary medicine in Afghanistan. *Journal of Veterinary Medical Education*, 32(2): 163-168. DOI: <https://www.doi.org/10.3138/jvme.32.2.163>
- Siddiky NA (2017). Backyard poultry production systems in SAARC member states. SAARC Agriculture Centre (SAC). Available at: <Backyard Poultry Production Systems in SAARC Member States | sac>
- Subasinghe R, Alday-Sanz V, Bondad-Reantaso MG, Jie H, Shinn AP, and Sorgeloos P (2023). Biosecurity: Reducing the burden of disease. *Journal of the World Aquaculture Society*, 54(2): 397-426. DOI: <https://www.doi.org/10.1111/jwas.12966>
- Upton M (2007). Scale and structure of the poultry sector and factors inducing change: Inter-country differences and expected trends. *Proceedings of the FAO Conference*, pp. 49-79. Available at: <Poultry in the 21st Century>
- Vaarst M, Steinfeldt S, and Horsted K (2015). Sustainable development perspectives of poultry production. *World's Poultry Science Journal*, 71(4): 609-620. DOI: <https://www.doi.org/10.1017/S0043933915002433>
- Wasti S, Sah N, and Mishra B (2020). Impact of heat stress on poultry health and performances, and potential mitigation strategies. *Animals*, 10(8): 1266. DOI: <https://www.doi.org/10.3390/ani10081266>
- Wilson RT (2021). An overview of traditional small-scale poultry production in low-income, food-deficit countries. *Annals of Agricultural & Crop Sciences*, 6(3): 1077. Available at: <https://austinpublishinggroup.com/agriculture-crop-sciences/fulltext/aacs-v6-id1077.php>
- World health organization (WHO) (2020). Global and regional food consumption patterns and trends. World Health Organization. Available at: [https://who.int/nutrition/topics/3\\_food\\_consumption/en/index4.html](https://who.int/nutrition/topics/3_food_consumption/en/index4.html)

- World health organization (WHO) (2023). Red and processed meat in the context of health and the environment: many shades of red and green. Information brief. World Health Organization. Available at: [Red and processed meat in the context of health and the environment: many shades of red and green: information brief](#)
- Wong JT, de Bruyn J, Bagnol B, Grieve H, Li M, Pym R, and Alders RG (2017). Small-scale poultry and food security in resource-poor settings: A review. *Global Food Security*, 15: 43-52. DOI: <https://www.doi.org/10.1016/j.gfs.2017.04.003>
- World Bank (2014). Islamic Republic of Afghanistan agricultural sector review: Revitalizing agriculture for economic growth, job creation and food security. World Bank. Available at: <http://hdl.handle.net/10986/21733>
- World Bank (2015). Revitalizing agriculture for growth, jobs, and food security in Afghanistan. Available at: [Revitalizing Agriculture for growth, jobs, and food security in Afghanistan](#)
- World Bank (2016). Afghanistan - Country partnership framework for the period FY17-FY20 (English). Washington, D.C. World Bank Group. Available at: <http://documents.worldbank.org/curated/en/360811467992625828/Afghanistan-Country-partnership-framework-for-the-period-FY17-FY20>
- World Bank (2023). Population growth (annual percent)—Afghanistan. Available at: [Population growth \(annual %\) - Afghanistan | Data](#)
- Zahir A, Nasim M, Jauhar S, Naseri E, Sarwary A, Noor, and Hamdard E (2024). The role of livestock resources in sustainable food security and livelihoods in Afghanistan. *Journal of Natural Science Review*, 2(Special Issue): 495-516. DOI: <https://www.doi.org/10.62810/jnsr.v2iSpecial.Issue.150>
- Zrawar M, Rasikh M, Danishyar E, and Motmain Z (2023). Study of production performance and economic of broiler farms in Parwan Afghanistan. *Journal for Research in Applied Sciences and Biotechnology*, 2(5): 108-112. DOI: <https://www.doi.org/10.55544/jrasb.2.5.18>

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