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MARKET ANALYSIS

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Chicken meat production in global comparison – production systems and economics

ABSTRACT

Global chicken meat production has continued to expand, reaching a record 103.8 million tons in 2023, representing a 1.6 percent increase compared to the previous year. Benchmarking and comparative farm-level analyses provide valuable insights for assessing performance at national, regional, and global levels. The agri benchmark Poultry Network applies the typical farm approach, working in collaboration with international research partners, producers, and local experts to collect and validate standardised farm-level data using harmonised procedures and a simulation model. This study analyses global chicken meat production systems and the conditions shaping them. It examines their economic aspects and identifies key critical success factors influencing production efficiency. The study reveals that high feed-use efficiency and farm performance in broiler production is often attributed to a combination of three factors which include: the rearing of high-quality chicks, the use of high-quality feed, and good animal husbandry practices. The study identifies feed and day-old chicks' costs as the most important cost components for all typical farms included in the agri benchmark poultry network. A farm's competitiveness in terms of production costs is therefore heavily dependent on its ability to effectively manage feed and day-old chick costs.

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Introduction

Poultry production has evolved rapidly in recent decades, becoming a cornerstone of global agriculture. In 1961, global poultry meat production was approximately 8.04 million tons (FAO, 2025). By 2024, this figure had risen to an estimated 141.42 million tons, surpassing both pork and beef to become the world's most consumed meat (FAO 2023; FAO, 2025). This growth is driven by advances in breeding, shifting consumer preferences, and economic factors making poultry an affordable protein source (OECD-FAO, 2021).

According to recent FAO statistics, the USA, Brazil and China are expected to maintain their dominant positions in the poultry international market despite facing country-specific challenges. Over the past decade, Europe has experienced a significant increase in production levels, with particularly notable growth observed in Poland and Hungary (FAO, 2025).

The relatively affordable consumer prices of poultry meat compared to beef and sheep meat increases its attractiveness as a cost-effective source of animal protein, particularly during periods of economic strain (Thobe *et al*., 2024). Moreover, rapid population growth coupled with urbanisation have boosted the global demand for poultry, rendering it the most widely traded livestock commodity worldwide in terms of volume (Farris *et al*., 2024).

Historically, Asian countries have represented the largest import market for chicken meat. With consumption growing much faster than production in China, chicken meat imports from Brazil reached unprecedented heights in 2023 – more than treble from 2013 levels (Figure 1). Exports from Brazil, as the world's largest chicken meat exporter, to the UAE and Saudi Arabia, as key importers in the Middle East, have reached 818,000 tons in 2023 – 17 percent of total Brazil's production.

Among the top 10 chicken meat trade flows in the year 2023, the traditional trade flow from the USA to Mexico comes first in with a 6 percent increase year-on-year, but still in line with the last 10-year average.

Despite poultry production's global expansion, each production region presents unique economic and structural challenges, making it essential to develop sustainable, region-specific practices and policies (Menghi *et al*., 2014). Production systems vary widely, from large-scale industrial farms to small backyard operations (Chibanda *et al*., 2024a). Given the rapidly increasing global demand for poultry meat, understanding how different poultry production systems across diverse regions can effectively respond to this growing demand is a critical issue for farmers, policy makers and agribusinesses. Central to this discussion are questions related to the underlying causes of limited competitiveness in some production systems worldwide, the most effective

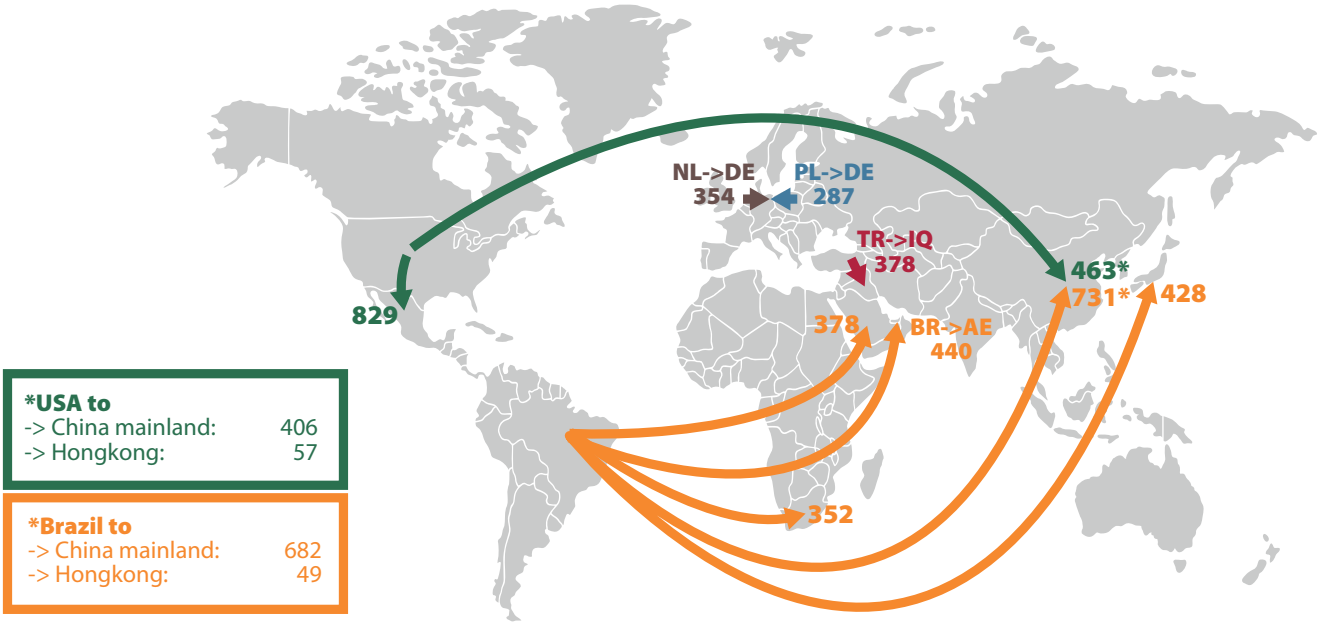

Figure 1: Top 10 chicken meat export flows 2023 ('000 tons).

Source: Own illustration based on UN Comtrade 11.2024, * China mainland, Hongkong and Macao.1

strategies to enhance the performance of domestic production, the environmental implications of various production systems across regions and the extent to which government regulations shape international competitiveness.

Extensive research exists on the economics of poultry farming at the national level investigating country-specific aspects (Adaszyńska-Skwirzyńska *et al*., 2025; Chen *et al.,* 2020; Chibanda *et al*., 2022, 2024b; Cobanoglu *et al*., 2014; Elmelegy et al., 2025; Kamruzzaman *et al*., 2021; Kawsar *et al.,* 2013; Mansour and Elsebaei, 2020; Marmelstein *et al.,* 2024; Verspecht *et al.,* 2011; Zamani *et al*., 2022). Recently, Chibanda et al. (2024a) evaluated the competitiveness of broiler production systems in west Africa (Ghana and Senegal), relative to systems in European countries (Germany and the Netherland). Such focus on single country assessments has left a gap in systematic cross-country comparisons of efficiency, cost structures, profitability, and competitiveness of different poultry production systems worldwide. Addressing this gap is essential for understanding the underlying drivers of poultry production systems, the factors shaping differences in efficiency and economic performance, the structural developments of poultry production across countries, the adaptive strategies farms are likely to adopt under changing framework conditions, and the geographical shifts in where poultry meat will be produced in the future.

This study aims to introduce comparative insights into the economics of global poultry production systems and the structural conditions influencing their development. The primary focus is on assessing the economic performance of these systems and identifying key factors that drive production efficiency and profitability. The analysis is based on an international comparison of typical broiler farms across countries participating in the agri benchmark Poultry Network. The Network was established in 2023 as a global, non-profit network of producers and agricultural experts representing major poultry production systems worldwide. In total, 21 typical broiler production systems from 11 countries - Austria, China, Finland, Ghana, Germany, Hungary, Iran, Senegal, South Africa, Spain, and the Netherlands - are examined. The typical farms are constructed as "virtual" farm datasets that represent the predominant production systems in each region employing the typical farm approach (Chibanda *et al*., 2020). These datasets are developed through expert-based interviews conducted in accordance with the *agri benchmark* Network's Standard Operational Procedure (Chibanda *et al*., 2020), thereby ensuring comparability across regions. To understand the framework conditions shaping broiler production, additional expert interviews, stakeholder consultations and conferences were conducted.

The structure of this article is organised into four main sections. Following this introductory section, Section 2 outlines the methodological framework, emphasising the application of the typical farm approach for constructing the typical broiler farms used in the analysis. Section 3 presents the empirical findings, providing a comparative assessment of production costs, returns, and profitability across diverse broiler production systems. This section also identifies key internal and external drivers of economic performance, that influence the success of broiler farming systems. The final section explores how country-specific conditions – such as institutional frameworks, market dynamics, and policy objectives – shape the structural characteristics and operational practices of typical broiler farms. Moreover, it examines the ways in which these contextual factors influence the economic performance of poultry production systems. By addressing these interdependencies, the study contributes to the broader discourse on optimising poultry production systems in a manner that reconciles economic efficiency with environmental sustainability and social responsibility.

Methodology

The agri benchmark SOP

This study employed the typical farm approach to compare the technical and economic performance of broiler farms across 13 countries (Austria, China, Finland, Ghana, Germany, Hungary, Iran, Senegal, South Africa, Spain, and the Netherlands). The typical farm approach is a structured methodology for constructing "synthetic" farms, commonly referred to as "typical" or "representative" farms, that reflect prevailing production systems in a given region. The methodology was implemented in accordance with the *agri benchmark* Standard Operating Procedure (SOP), as outlined by Chibanda *et al*. (2020). The SOP consists of five key steps (see Figure 2): Step 1 and Step 2 involve identifying key broiler production regions (hotspots) and determining the most prevalent production systems within these regions; Step 3 entails the collection of farm-level data; Step 4 entails the processing and validation of data through cross-checking procedures; and Step 5 involves the annual updating of farm data.

Step 1 and Step 2: Identifying key broiler production regions and the most prevalent production systems

Key broiler-producing regions and prevalent production systems were identified in each country through literature reviews, stakeholder workshops, or expert consultations, depending on the availability of national and regional farm-level data. Experts consulted included extension agents and academic researchers with local knowledge.

Step 3: Data collection and construction of typical farms

Farm-level data were collected through semi-structured interviews with producers operating in the previously identified regions. A standardised questionnaire, developed by the *agri benchmark* Poultry Team, guided the data collection process. Farm selection was undertaken in collaboration with regional extension officers and consultants familiar with local production practices. These individual farm data were then used to construct typical farms via a "typification" process. This involved reviewing the data point by point and substituting farm-specific figures with values representative of the broader production system. This process was conducted through either focus group discussions (as in Ghana and Senegal) with producers or expert consultations to ensure that the final figures were truly reflective of regional norms.

Step 4: Processing and cross-checking

The Technology Impact Policy Impact Calculations (TIPI-CAL) model was employed for data analysis. As described by Chibanda *et al.* (2024b) and Deblitz (2024), TIPI-CAL is a comprehensive farm-level production and economic simulation model, useful for cross-country benchmarking, practice change analysis, and policy impact assessment. In this study, the model facilitated the estimation and comparison of key performance indicators such as the feed conversion ratio (FCR), cost structures, and profitability. The model allows for profitability assessments across three-time horizons:

- Short-term profitability was calculated by subtracting cash expenses from total returns.
- Medium-term profitability included both cash and depreciation costs.
- Long-term profitability further incorporated opportunity costs into the analysis.

Step 5: Updating

To maintain the relevance and accuracy of the typical farm data, annual updates are performed. These include adjustments to input and output prices (e.g., feed, labor, manure, and broiler meat) based on current market conditions.

Figure 2: Overview of the typical farm approach (agri benchmark SOP)
Source: Chibanda *et al.* (2020)

Limitations

While the typical farm approach is a valuable methodology for comparative farm-level analysis, especially in international contexts, it is not without limitations. A significant constraint is the absence of statistical representativeness, as typical farms are not derived from stratified or random samples. Consequently, the findings should be interpreted with an understanding that they reflect typical – not average or median – conditions within a production system. Nonetheless, the methodology remains robust for benchmarking and policy analysis due to its standardisation and expert-based validation.

Comparison of feed-use efficiency

The result section analyses global poultry production systems and the conditions shaping them. It examines their economic aspects and identifies key factors influencing efficiency and sustainability. Results are displayed by key determinants reflecting the efficiency of a system.

The feed conversion ratio (FCR) is one of the primary cost drivers in broiler production and was utilised to assess the feed use efficiency of the typical farms (Figure 3). Two key determinants influenced feed use efficiency among these farms: the quality of inputs (i.e., day-old chicks (DOCs), feed) and poultry husbandry practices. Consequently, farms located in countries with well-developed hatchery and feed sectors, coupled with farmers practicing effective poultry husbandry, generally demonstrated lower FCRs, thereby achieving greater feed use efficiency. However, it is important to note that the length of the feeding period also affects FCRs, as farms with extended feeding periods typically were found to have higher FCR values across the typical farms derived from the collected data.

Due to the standardisation of poultry practices and the use of high-quality inputs such as day-old chicks and feed, typical farms in European countries generally exhibit high and consistent feed use efficiency. However, among all farms analysed, the South African farm (ZA_2.2M) emerged as the most efficient in terms of feed use. This is most likely attributed to a combination of a well-developed hatchery and feed sector, as well as consumer preferences for lighter-weight chickens that are slaughtered at a live weight of approximately 1.8 to 1.9 kg, which results in a relatively short feeding period of 31 days. In contrast, feed use efficiency in Ghanaian and Senegalese farms tends to be lower and exhibits considerable variation between typical farms within the same country. This disparity can be attributed to differences in poultry husbandry practices and varying levels of access to high-quality inputs. The Iranian farm also reported a relatively high FCR due to a prolonged feeding period of 49 days, and final live weight of 2.6 kg. Due to culinary traditions, consumer preferences in Iran tend to lean toward heavier birds, especially in the context of whole chickens.

Comparison of production costs

As illustrated in Figure 4, the primary cost drivers for all typical farms included in our network are feed and day-old chicks (DOCs). Therefore, a farm's competitiveness in terms of production costs is heavily dependent on its ability to effectively manage feed and day-old chick costs. Among the studied farms, the typical farm from Iran exhibits the lowest production costs, which resulted by subsidised feed programs for poultry producers in Iran (IR_143k), particularly regarding energy and imported feed. Consequently, feed prices in the Iranian farm were the lowest in the network countries. In contrast, Ghana and Senegal have the highest

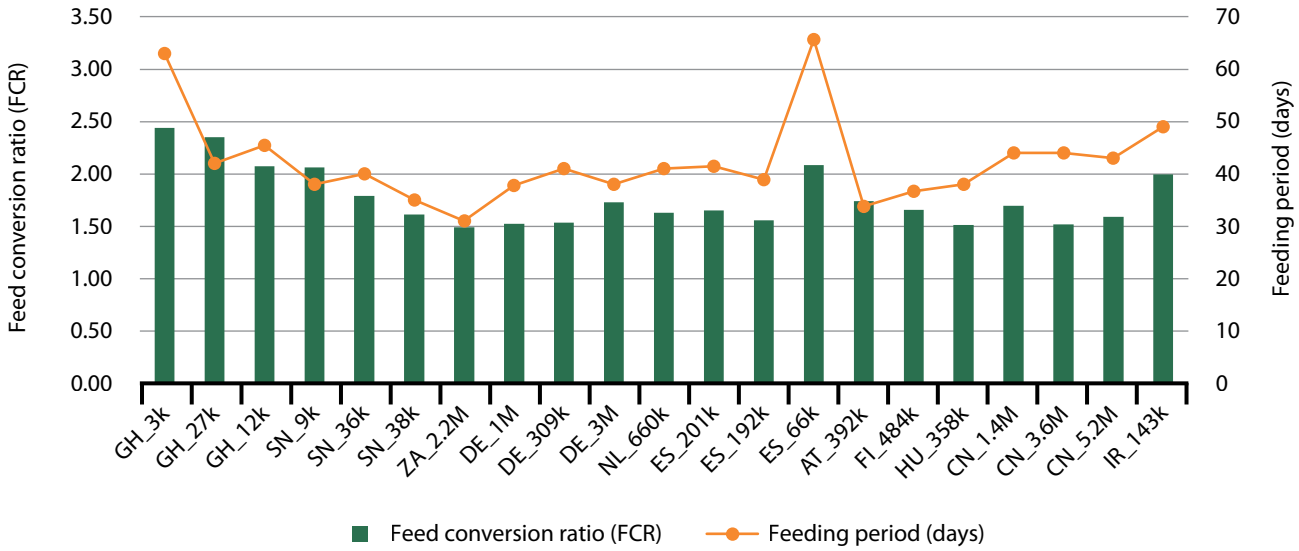

Figure 3: Comparison of feed use efficiency.

Countries: GH= Ghana, SN= Senegal, ZA= New Zealand, NL= The Netherlands, ES= Spain, AT= Austria, FI= Finland, HU= Hungary, CN= China, IR= Iran. Explanation of the names of the farms on the x-axes: Country Number of broilers sold per year. Examples: DE_1M: German farm with 1 million broilers sold per year.
Source: Own calculations

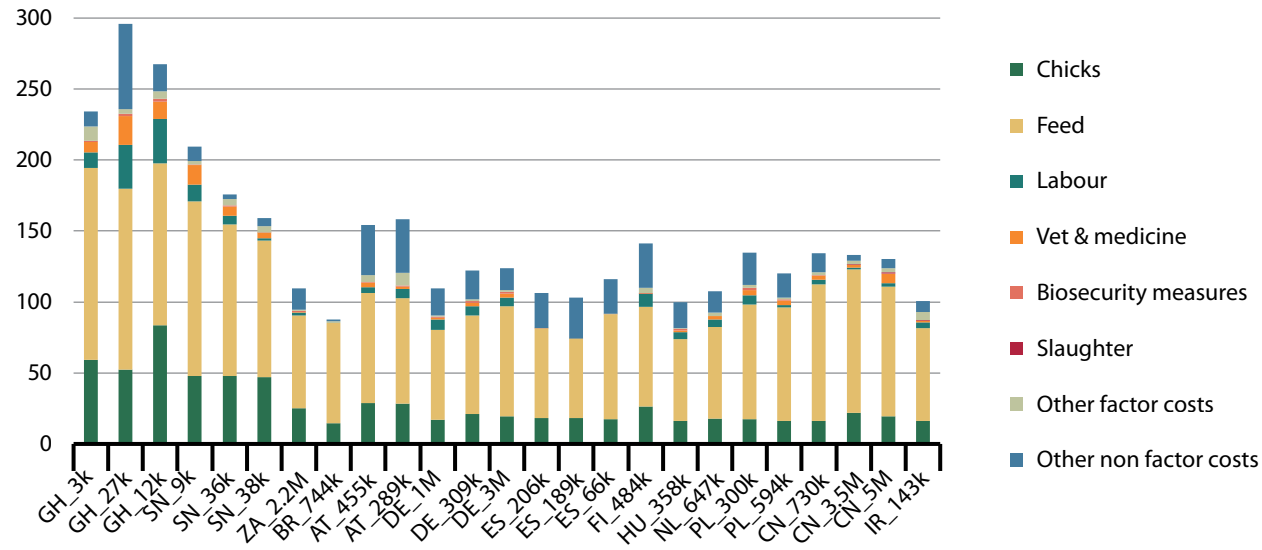

Figure 4: Comparison of production costs (US Dollar/100 kg live weight).
Countries: GH= Ghana, SN= Senegal, ZA= New Zealand, NL= The Netherlands, ES= Spain, AT= Austria, FI= Finland, HU= Hungary, CN= China, IR= Iran.
Explanation of the names of the farms on the x-axes: Country Number of broilers sold per year. Examples: DE_1M: German farm with 1 million broilers sold per year.
Source: Own calculations

production costs due to substantially higher feed and day-old chicks' prices.

The production costs of European farms can be considered to be relatively moderate, positioning them between the highest-cost and lowest-cost groups. The Austrian (AT_436k) farm has the highest costs among the European farms. Increased culling of parent stocks due to Salmonella resulted in a shortage of high-quality Ross 308 brother cocks on the Austrian market. The Salmonella outbreaks in Austria over the past few years was serious at the national level (Kornschober and Pekard-Amenitsch, 2023). Problems with parent stocks result in poor chick quality and overall poorer fattening performance. The typical Finnish broiler farm performs better than most in terms of feed-use efficiency (FCR). Although the typical Finnish farm (FI_484k) has the highest mortality rate among European farms – primarily due to the non-use of antibiotics and the strict culling of herds infected with salmonella, as well as the avoidance of thinning as a biosecurity measure – it still ranks among the top farms in terms of total production per square metre. This strong performance is attributed to the use of high-quality chicks and feed, along with excellent animal husbandry practices. Among the German farms, the production costs are higher for DE_3M as compared to DE_1M and DE 309k. The costs of feed and day-old chicks are also the most important cost items for the typical German broiler farms. Feed costs are quite similar between the three German farms and represent 69 to 72 percent of the total cash costs being the lowest for DE_3M and the highest for DE_309k. DE_3M has the highest mortality rate among the German farms, primarily due to structural deficiencies in the pens, such as old floors and inadequate climate control systems. In north-eastern Germany, broiler barns are often repurposed cattle sheds or outdated facilities from the former agricultural production cooperatives of the German Democratic Republic (GDR) era. In contrary, poultry farmers in north-west Germany (DE_1M) often operate in modern facilities which results in risk reduction of disease outbreaks, lowering treatment costs and production losses. North-west Germany is a highly specialised cluster region for livestock farming, which is characterised by a high density of specialised companies, concentrated expertise, high capital intensity and short transport distances.

Due to the sharp increase of energy prices in Europe (EUROSTAT, 2025), the share of energy costs in total cash costs have gained in significance. In modern poultry farming, energy is essential for heating, ventilation, lighting, and the automation of feeding and drinking systems. Rising energy prices therefore have a direct impact on production costs and can affect profitability. In recent years, energy prices have been subject to considerable fluctuations due to geopolitical crises, changes in energy policy, and the growing importance of renewable energy sources. Many broiler farms are responding by investing in energy-efficient technologies or renewable energy systems such as photovoltaics and biogas plants to reduce their dependence on fossil fuels and lower costs.

The typical farms are using breeds like Cobb and Ross, that grow rapidly and have high meat yields – especially in the breast and thighs – and show good feed efficiency. These hybrids are created through selective crossbreeding and are widely used in industrial poultry farming to reach market weight quickly.

Comparison of returns and profitability

In terms of the profitability of the typical farms, Figure 5 indicates that all farms, with the exception of two in China (CN_1.4M and CN_5.2M), are profitable in the short term. Hence, all other farms, with the exception of these

two Chinese farms, are able to cover their cash costs. In addition to the relatively high feed prices, the unprofitability of CN_1.4M and CN_5.2M is mainly attributed to high one-day-old chick prices in the smaller farm (third highest prices after Ghana and Senegal), and the low selling prices for the larger one (the lowest among the farms analysed). In contrast, farms in Ghana and Senegal achieve significantly higher selling prices compared to the other typical farms. Thus, despite facing the highest production costs, these farms have higher profit margins per production cycle due to their elevated selling prices. Ghanaian farms are able to obtain high selling prices because they market their chickens during festive seasons, when demand for live domestic chicken surges. However, it is important to note that broiler production in Ghana is typically seasonal (production targeting the festive season). Therefore, the typical farms are only profitable when production is seasonal. Farms in Senegal benefit from high selling prices due to a ban on poultry meat imports, which fosters favourable market conditions.

In contrast, European farms typically have lower selling prices, leading to significantly reduced profit margins compared to farms in other regions. Bonus payments vary depending on the country and applicable standards. For the Hungarian farm (HU_358k), renting is economically advantageous. This practice is common in Hungary due to various factors – such as limited capital – and is also frequently observed among affiliated companies. Among the German farms, DE_1M is the most profitable, primarily due to lower cash, depreciation and opportunity costs. This concentration of expertise, infrastructure, and capital not only boosts current efficiency and productivity but may also facilitate future investments in capital-intensive, modern animal welfare stables. The supportive environment and close collaboration among specialised stakeholders create favourable conditions for adopting innovative housing systems that meet higher welfare standards while maintaining economic viability.

Discussion and Conclusions

High feed efficiency and overall farm performance in broiler production is often attributed to a combination of factors, including rearing high-quality chicks, using high quality feed and good animal husbandry practices (Thobe *et al*., 2024). Consequently, the results (Figures 4 and 5) suggest that the best performing farms have better access to these critical success factors.

Several factors contribute to the observed differences in feed and day-old chick costs. First, the level of development within a country's domestic feed sector and its capacity to locally produce key feed ingredients, such as maize, wheat, and soybeans, play a significant role in determining feed prices. A comparative example is evident among the three African countries. Unlike Ghana and Senegal, South Africa has a more developed feed sector, with substantial domestic production of feed ingredients (e.g., maize). Consequently, South African farms benefit from lower feed prices, positioning their feed costs among the lowest compared to other typical farms.

At the European level, the Spanish farms showed relatively low feed costs. This is mainly attributed to the highly integrated production system, where feed is provided by integrator companies at prices which are the lowest among the network farms in Europe. In contrast, the growing demand on feed ingredients from livestock producers in China (mainly beef and pig) pushed up feed prices in China's farms to be among the highest among the network farms (second highest prices after Ghana). Second, low feed -use efficiency, as reflected by a high feed conversion ratio (FCR), also affects feed costs. Farms with lower efficiency require more feed than necessary, as observed in Ghanaian farms, which results in elevated feed costs. Third, the level of development within the hatchery sector influences day-old chicks' prices. Countries with less developed hatchery sectors often

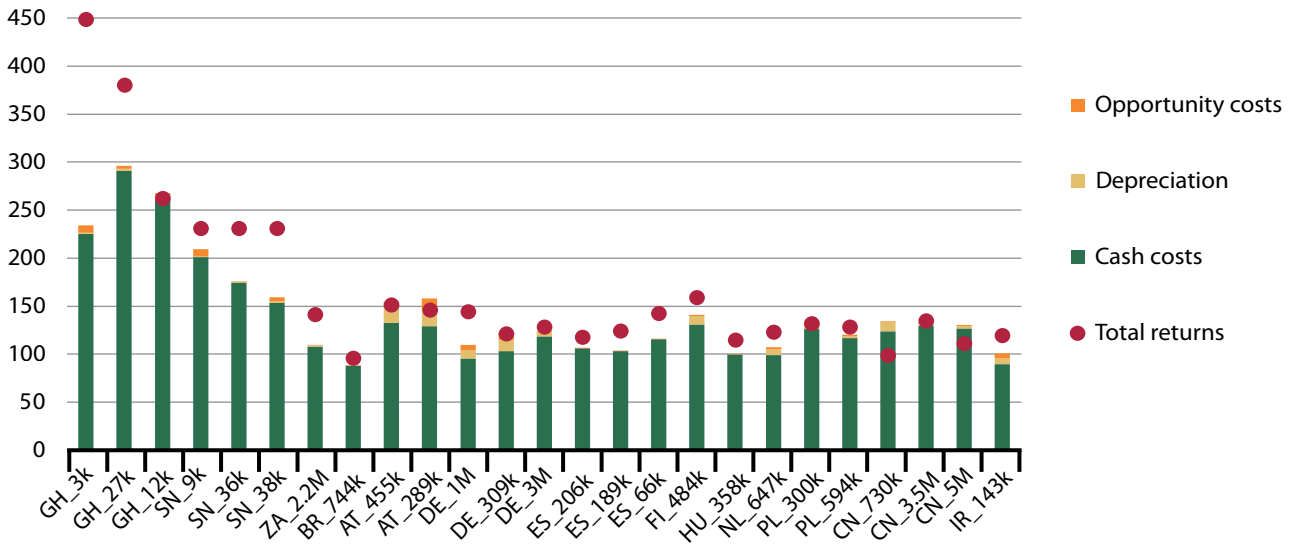

Figure 5: Comparison of total returns and profitability (US Dollar/100 kg live weight).
Countries: GH= Ghana, SN= Senegal, ZA= New Zealand, NL= The Netherlands, ES= Spain, AT= Austria, FI= Finland, HU= Hungary, CN= China, IR= Iran
Explanation of the names of the farms on the x-axes: Country Number of broilers sold per year. Examples: DE_1M: German farm with 1 million broilers sold per year.
Source: Own calculations.

rely on importing day-old chicks, hatching eggs, or breeder stocks, all of which can be costly.

Further the results prove, that the economic performance is highly dependent on securing high selling prices for their production. Further, the farm´s profitability is sensitive to market dynamics, including consumers´ demand and willingness to pay higher prices for broiler meat. Further classification of results based on system characteristics such as integration level, breed used, market access, and management practices provides deeper insights. For example, the analysis reveals correlations between higher costs and stronger biosecurity measures, offering evidence of the trade-offs involved in achieving higher performance.

This study highlights the interplay between country-specific conditions, policy objectives, and the structure and practices of typical broiler farms worldwide. The study demonstrates how these factors collectively influence economic farm performance. The diversity in national priorities – whether rooted in consumer demand, legal frameworks, or institutional settings – creates distinct operating environments for poultry producers across countries.

A key finding is the significant role of consumer preferences in shaping production practices. In South Africa, where there is a pronounced preference for lighter broilers, producers tend to adopt shorter feeding periods. This leads to relatively favourable feed conversion ratios (FCRs), since broilers are harvested before reaching a physiologically less efficient growth phase. In contrast, Iranian consumers demand heavier birds, resulting in extended fattening periods and consequently higher FCRs. These divergent preferences illustrate how market-driven parameters can directly affect farm-level efficiency metrics, often in ways that reach further than purely technical or biological optimisation.

Beyond demand driven market forces, the regulatory environment profoundly influences farm structures and cost structures. In Germany, strict environmental and animal welfare regulations impose higher compliance costs on producers. These may include investments in enriched housing systems, manure management technologies, or reduced stocking densities – all of which influence operational efficiency and profitability. Conversely, in Iran, state subsidies for animal feed mitigate some of the variable costs associated with broiler fattening, allowing producers to maintain profitability even under less efficient technical conditions. This disparity underscores the importance of policy instruments in shaping not only cost structures but also incentives for innovation and sustainability in the sector.

Slaughterhouse requirements, particularly those concerning the handling of flocks infected with pathogens such as Salmonella spp., add an additional layer of complexity. While such regulations are primarily designed to safeguard public health, their implications for producers are often indirect yet substantial. For instance, the categorisation of flocks based on pathogen load may affect marketability and pricing, while necessitating changes in on-farm management and biosecurity. However, the degree to which farmers can directly control these outcomes is limited, highlighting the need for better integration and communication between production and processing stages.

Furthermore, the emergence of specialised cluster regions for broiler production within countries influences the structure and performance of typical farms. In Germany, for example, regions such as Northwest-Germany have evolved into centres of intensive poultry farming due to favourable infrastructure, agglomeration effects, and historical policy support. These areas benefit from economies of scale, access to specialised labour and services, and logistical advantages. However, such regional concentration may also exacerbate environmental pressures and increase vulnerability to market or disease shocks. The variation in farm structures across different regions within the same country underscores the importance of spatially sensitive policy-making and the typical farm approach (Chibanda *et al*., 2020).

The results of this study illustrate that optimising broiler production requires a nuanced understanding of the interconnected drivers that shape farm-level outcomes. Efforts to enhance economic viability must therefore be aligned with broader societal goals, including animal welfare, environmental protection, public health and food security. Future research should further investigate how integrated policy frameworks can harmonise these often-competing objectives, especially in light of evolving consumer expectations and climate challenges.

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