



Challenges of the poultry industry in West Africa

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This systematic research evaluates the major obstacles faced by the West African poultry sector, including disease outbreaks, poor market access, insufficient infrastructure, restricted financial resources, and a shortage of skilled labor. The industry faces high mortality rates, trade restrictions, and economic losses due to disease outbreaks. Improved surveillance, biosecurity measures, and vaccination programs are crucial. The research highlights the need for improved infrastructure, quality standards enforcement, market information systems, and supportive policies to enhance competitiveness and sustainability. The poultry industry in West Africa faces challenges in market access, hindering its development and competitiveness. The socio-economic role of poultry production is emphasized, including its contribution to food security and income generation. Challenges faced include disease outbreaks, lack of access to credit and technical knowledge, high production costs, poor infrastructure, and competition from imported poultry products. Possible solutions include improved veterinary services, extension programs, cooperative societies, government support in the form of loans, and capacity training for farmers.

Keywords: poultry industry, West Africa, challenges, solutions, production

Introduction

Agriculture is crucial for West Africa's economies and socio-economic development, contributing to 30% of GDP and employing 50% of the workforce (Renard et al., 2004). Poultry plays a significant role in household food security, providing income, quality food, and fertilizer (Molina-Flores et al., 2020). However, increasing urbanization and population in Sub-Saharan Africa have led to a growing demand for animal products, particularly poultry meat (Meltzer, 1995; Robinson et al., 2011). Meat consumption per person per year is expected to increase by 26%, particularly chicken meat. Importation of poultry and poultry products by many African countries is increasing at a faster rate than local production, resulting in a drop in self-sufficiency rates (Kristjanson et al., 2001, Bebay, 2003, Ahima, 2005; TMottet and Tempio, 2017; FAO, 2010; OECD-FAO, 2010).

The West African poultry industry faces challenges such as disease outbreaks, poor policy frameworks, insufficient infrastructure, and limited capital access. This systematic review aims to identify and address these obstacles to promote sustainable poultry production and long-term viability in the region. It also focuses on improving market access and obtaining high-quality feed, highlighting the need for targeted initiatives to improve accessibility, cost, and quality.

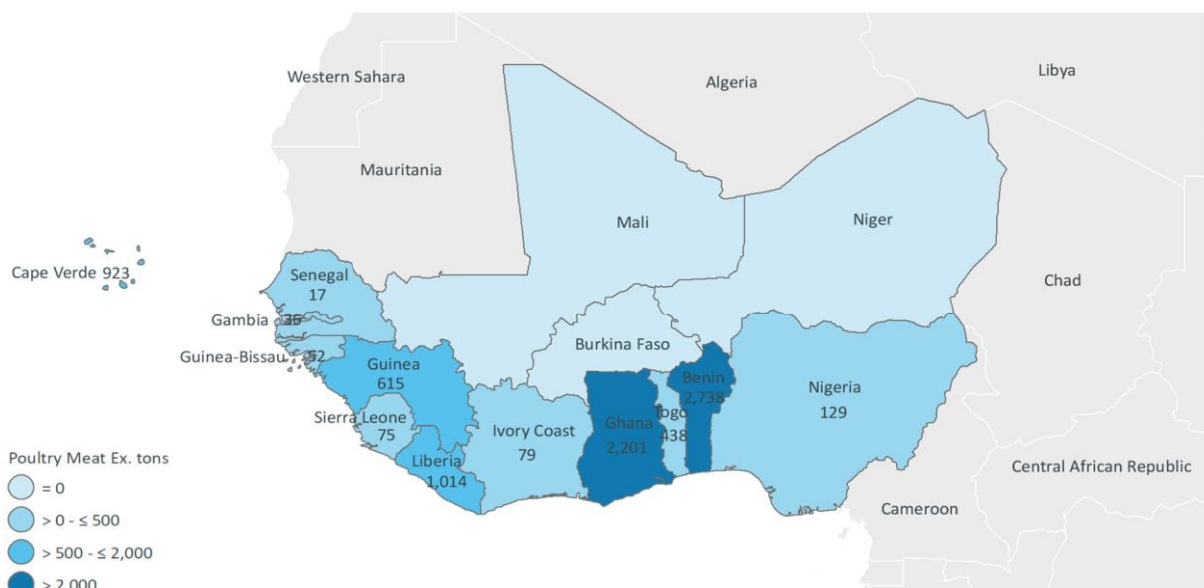


Figure 1. The Volume of Poultry Meat Exports from Germany to West African Countries in 2017 (in tons)
Source: Data are based on UN Comtrade (2017). Poultry meat HS codes: 0207, 160231, 160232, 160239. Map created with ESRI (2020). **NOTE:** Data are based on Germany as the reporting country



Figure 2. The Volume of Live Poultry Exports from Germany to West African Countries in 2017 (in kg)
Source: Data are based on UN Comtrade (2017). HS code of live poultry: 0105. Map created with ESRI (2020)
NOTE: Data are based on Germany as the reporting country

Clearer statement of the scope and objectives of the review

The scope of this review is to systematically analyze the multifaceted challenges faced by the poultry industry in West Africa, with a particular focus on disease outbreaks, infrastructure inadequacies, financial accessibility, market access, feed availability, and regulatory issues. The objectives are to:

Identify Key Challenges: To delineate the primary obstacles hindering the growth and sustainability of the poultry sector in West Africa, including health crises like Newcastle disease and avian influenza, infrastructural deficits, and economic barriers.

Explore Socio-Economic Factors: To investigate the socio-economic dynamics influencing the poultry industry, such as the role of smallholder farmers, market access limitations, and the implications of trade policies on local production and consumption.

Recommend Strategic Interventions: To propose actionable strategies and policies aimed at mitigating the identified challenges, enhancing disease management practices, improving infrastructure, increasing access to finance, and fostering market competitiveness.

By aligning the study with these objectives, the review aims to provide specific insights that can inform policymakers, industry stakeholders, and researchers, ultimately contributing to a more resilient and productive poultry sector in West Africa.

1.0. Challenges of the poultry industry in West Africa

1.1. Disease outbreaks

Disease outbreaks like avian influenza and Newcastle disease in West Africa impact the poultry industry, causing high mortality rates and economic losses. Disease outbreaks in West Africa's chicken industry pose a threat to food security and financial losses, necessitating a systematic review to identify primary outbreaks and develop targeted initiatives and policies to reduce them. West Africa's chicken sector faces disease outbreaks like Newcastle disease and avian influenza due to inadequate veterinary knowledge, surveillance systems, and biosecurity measures Abolnik et al. (2018). Studies by Ayinde et al. (2019) and Adesina et al. (2017) mentioned poultry producers in West Africa face challenges like limited market access, unfair competition, and high production costs due to the dominance of imported poultry products. According to Abolnik et al. (2021), recent outbreaks of avian influenza and Newcastle disease have continued to threaten the poultry industry in West Africa, exacerbating existing vulnerabilities in the sector". Studies reveal various diseases impacting West Africa's poultry industry, primarily avian influenza, leading to high mortality rates, reduced egg production, and trade restrictions.

1.1.1 Newcastle disease

Newcastle disease, causing respiratory and neurological symptoms, is a significant outbreak affecting West Africa's poultry industry, necessitating vaccination, biosecurity measures, and strict movement control to prevent and control the disease, studies by Abolnik et al. (2016) and Aini et al. (2019).

1.1.2. Infectious bursal disease

Research conducted in the region by Adene et al. (2017) and Ibitoye et al. (2020), stated that Gumboro disease, also known as infectious bursal disease, poses a significant threat to the West African chicken sector, particularly to young hens, necessitating vaccination, strict biosecurity protocols, and effective farm management techniques.

1.1.3. Impact on the poultry industry

Disease outbreaks in the poultry industry significantly impact farmers, leading to increased production costs, lost revenue, and market restrictions, while also posing public health risks.

1.1.4. Strategies for disease control

West African poultry industry strategies, including improved surveillance, biosecurity, and vaccination programs, face challenges like limited resources, inadequate infrastructure, and lack of farmer awareness. The review emphasizes the need for improved disease surveillance and monitoring systems in West Africa's poultry industry, recommending collaboration between government agencies and international organizations. The poultry industry in West Africa faces severe economic and public health consequences from disease outbreaks. To manage and prevent these, robust surveillance systems, improved biosecurity measures, and vaccination programs are crucial.

1.2. Inadequate infrastructure

The poultry industry faces challenges due to inadequate infrastructure, including poor road networks, unreliable electricity supply, and limited cold chain facilities, necessitating significant investments in infrastructure development.

According to Osei-Amponsah et al. (2022), inadequate infrastructure, particularly in rural areas, continues to impede the growth of the poultry industry, leading to significant post-harvest losses". Studies by Awuni et al. (2016) and Njue et al. (2018) stated the West African poultry industry faces challenges due to inadequate infrastructure, particularly in rural areas, including unreliable electricity supply, inadequate cold storage facilities, and poor transportation networks. Studies by Ayssiwede et al. (2018) and Osei-Amponsah et al. (2020) stated that the West African poultry industry faces challenges due to inadequate infrastructure, resulting in decreased productivity and post-harvest losses, necessitating investments in infrastructure development, technology transfer, and capacity building. Studies by Adeoye et al. (2018) and Alabi et al. (2020) also confirmed that the West African poultry industry faces significant challenges due to inadequate transportation infrastructure, leading to delays, increased product losses, and reduced market reach. Improving road networks, expanding facilities, and enhancing logistics are crucial. Again, Studies by Amponsah et al. (2019) and Fasina et al. (2017) proved that the West African poultry industry faces significant challenges due to inadequate storage infrastructure, resulting in post-harvest losses, reduced product quality, and limited market opportunities. Research by Awotide et al. (2018) and Kamuanga et al. (2021) highlighted West African poultry industry faces significant constraints due to inadequate processing infrastructure, leading to low product value addition, limited diversification, and reduced competitiveness. Investing in modern facilities, technology transfer, and technical assistance can improve processing capabilities. Another study by Ogundipe et al. (2020) and Sule et al. (2019) emphasized the West African poultry industry faces infrastructure challenges due to insufficient energy supply, high electricity costs, frequent power outages, and limited access to alternative energy sources. Improving infrastructure, promoting renewables, and providing incentives can help. To address this, investments in cold storage, refrigeration technologies, and efficient supply chain systems are needed. Inadequate infrastructure, including electricity, clean water, cold chain facilities, and road infrastructure, in many areas, negatively impacts chicken building temperature, health, and cleanliness, leading to higher mortality rates and reduced production efficiency. Inadequate infrastructure in West Africa affects the poultry industry, causing increased mortality rates, reduced productivity, and poor bird health, leading to increased disease susceptibility and reduced production.

1.3. Limited access to finance

Poultry farmers in West Africa face significant financial challenges due to high interest rates, collateral requirements, and limited financial literacy, which can be addressed through improved access to affordable credit and financial education programs. In their article, Ogunjobi et al. (2023) stated that limited access to finance remains a critical barrier for poultry farmers in West Africa, with high interest rates and stringent collateral requirements stifling growth". Awotide et al. (2017) and Ogundipe et al. (2019) stated that poultry farmers in West Africa face financial constraints due to limited access to credit, high interest rates, and inadequate collateral requirements, which can be improved through targeted credit schemes and financial literacy programs. Poultry farmers in West Africa face barriers to accessing finance due to a lack of collateral, high interest rates, complex loan application processes, and limited financial literacy. These issues make it difficult for them to secure credit facilities. The West African poultry industry faces challenges due to limited access to finance, hindering growth, investment, and efficiency, limiting the industry's potential and competitiveness in local and international markets. Studies by Adekunle et al. (2017) and Ogunjobi et al. (2020) highlighted that the difficulty in the West African poultry industry faces significant challenges in accessing formal credit, especially for small-scale farmers and processors. Financial institutions perceive the industry as high risk due to disease outbreaks and market volatility. Another research by Fakayode et al. (2018) and Oladejo et al. (2021) emphasized that the poultry industry in West Africa faces significant challenges in accessing finance due to stringent collateral requirements. Small-scale farmers lack the necessary collateral, limiting their ability to secure loans. Alternative collateral options and innovative financing models can help. High interest rates in West Africa hinder the poultry industry's access to finance, increasing borrowing costs and decreasing profitability. These rates are attributed to perceived risks, limited competition, and macroeconomic factors. Lowering interest rates and promoting competition can help was mentioned by Ibrahim et al. (2019) and Ojo et al. (2020). Limited financial literacy among poultry industry stakeholders hinders access to finance, affecting knowledge and skills in financial management, loan application processes, and record-keeping. Addressing this requires targeted education, training programs, farmer cooperatives, and mentorship as proved by Ajayi et al. (2018) and Onyeka et al. (2021).

1.4. Poor market access

Research by Kamuanga et al. (2019) and Dzankuu et al. (2016) emphasized that inadequate infrastructure in West Africa's chicken business hinders market access, leading to high transportation costs, post-harvest losses, and restricted market access. Investments in infrastructure development, such as road networks, cold storage facilities, and reliable electrical supplies, are crucial. Onu et al. (2024) also stated that "The poultry sector's market access is severely hindered by trade barriers and insufficient logistical support, necessitating urgent policy interventions". Research conducted by Adekunle et al. (2018) and Oluwatayo et al. (2020) highlighted that Inefficient transportation systems in West Africa's

chicken business hinder market access, causing product deterioration and delays. To improve market access, effective logistics systems, refrigerated vehicle usage, and improved transportation infrastructure are needed. Adu et al. (2017) and Ogunlade et al. (2021) conducted studies that demonstrated that the West African poultry sector faces significant challenges due to limited access to market information, making it difficult for producers and processors to make informed decisions on production, price, and market targeting. West Africa's poultry industry faces challenges due to trade barriers like tariffs, import restrictions, and non-tariff measures. These unfair practices, coupled with strict sanitary regulations, reduce local poultry products' competitiveness and discourage investment as highlighted in studies by Amegashie et al. (2018) and Onu et al. (2020). Strengthening market links, improving product quality, and encouraging local consumption can improve West African poultry market access, overcoming challenges like trade barriers, insufficient information, and imported competition. Chicken farmers in West Africa face numerous challenges, including a lack of market information, uneven quality standards, poor transit infrastructure, and adverse policies. Inadequate transportation, poor quality standards, and limited market data hinder their ability to meet consumer demands and make informed decisions.

1.5. Feed availability

The growth and productivity of the poultry business depend on the supply of high-quality and sufficient feed. However, obtaining enough feed at a reasonable price is a major obstacle for the West African poultry sector, which hinders its growth and competitiveness. The review identifies insufficient production networks, high prices, and restricted access to high-quality components as key factors contributing to low feed availability, weakened bird health, and decreased profitability for poultry farmers. According to Ogunwole et al. (2019) and Iyayi et al. (2017), the poultry industry in West Africa faces challenges due to limited availability and cost of quality feed, resulting in suboptimal feed formulations and compromising growth and productivity. Research conducted by Ayoola et al. (2017) and Egbeyale et al. (2020) brought attention to the West African poultry industry faces significant challenges due to the scarcity of feed ingredients like fishmeal, soybean meal, and maize. Ibeawuchi et al. (2021) emphasized that the scarcity of high-quality feed ingredients continues to limit productivity and profitability in the West African poultry industry". This leads to fluctuations in feed supply, restricted availability, and higher prices, negatively impacting poultry growth and productivity, and reducing farmer profitability. Research by Okeudo et al. (2018) and Ibeawuchi et al. (2021) highlighted the difficulties the West African chicken business faces challenges due to high feed costs, rising ingredient prices, shipping expenses, and exchange rates. Small-scale farmers struggle to finance these costs, limiting their investment in chicken production and company growth. Enhancing feed affordability, boosting local feed production, and providing financial assistance could make chicken farming more financially sustainable. Studies by Oyedele et al. (2017) and Afolabi et al. (2020) stated that the poultry industry in West Africa faces constraints due to limited research and innovation in feed production, highlighting the need for local adaptation initiatives. Poultry farmers face challenges in accessing high-quality feed ingredients due to high prices, limited production capacity, and transportation issues. Insufficient feed mills, processing facilities, and infrastructure also contribute to the scarcity of feed. The West African poultry industry faces challenges due to feed scarcity, leading to reduced productivity, increased mortality rates, and higher production costs, affecting egg production, development, and bird health, and limiting investment in technology.

1.6. Policy and regulatory issues

Oluwayelu et al. (2018) and Fasina et al. (2015) research on the poultry sector in West Africa faces challenges due to insufficient regulatory frameworks and inconsistent policies, necessitating comprehensive policies to address quality standards, market access, and disease control. Another study by Fasina et al. (2016) and Sule et al. (2020) mentioned the poultry industry in West Africa faces challenges due to weak policy frameworks, inadequate regulation implementation, and limited coordination among stakeholders, necessitating strengthening and promoting regulatory compliance.

1.6.1. Existing policy frameworks

The poultry industry in West Africa has various policy frameworks, but their effectiveness varies across countries, with some having comprehensive policies and others lacking clear, consistent ones.

1.6.2. Enforcement mechanisms

West Africa's poultry industry faces weak and inconsistent enforcement due to limited resources, corruption, and lack of coordination among government agencies, leading to non-compliance and unfair competition.

Table 1. Analysis of disease management strategies in the poultry industry across some selected West African countries

Country	Vaccination Programs	Biosecurity Measures	Local Practices	Challenges	Authors
Ghana	Newcastle Disease (NCD) - Vaccination against Avian Influenza (AI). Vaccination against Infectious Bursal Disease (IBD).	Limited access to updated vaccines. Restricted movement of poultry. Disinfection of equipment and facilities. Farmer training on biosecurity protocols.	Communal resources. Use of local herbs for disease prevention.	Awareness of biosecurity is low, with many farms using shared equipment. Typically, smallholder farming systems. Poor infrastructural support. Inadequate veterinary services Community-based vaccination campaigns. High cost of vaccines. Inadequate veterinary services	Franklin, 2023; Adzitey & Huda, 2019.
Togo	Government-funded vaccination campaigns. Routine vaccination against NCD and AI.	Controlled access to farms. Regular health checks of poultry. Proper waste disposal. Traditional practices of flock management. Use of local veterinary services. Increased focus on biosecurity training. Implementation of strict biosecurity protocols in commercial farms. Monitoring and surveillance systems.	Traditional practices dominate communal grazing. Use of polyvalent vaccines.	Challenges in timely distribution. Biosecurity practices are minimal. backyard farming dominates Limited funding and education on biosecurity. Limited access to vaccines. Poor infrastructure. Low literacy levels affecting training.	Tchouanguep, & Tchouanguep, 2018
Nigeria	Extensive vaccination programs for several diseases, including Marek's disease. National vaccination campaigns against NCD and AI.	Increased focus on biosecurity training. Implementation of strict biosecurity protocols in commercial farms. Monitoring and surveillance systems.	Backyard poultry management Informal farmer networks for sharing knowledge.	Vaccine hesitancy among farmers. Gradual improvement in biosecurity protocols but often inconsistent. Increased use of intensive farming but with poor biosecurity. High disease prevalence. Insufficient extension services. High mortality rates due to disease outbreaks. Poor enforcement of biosecurity measures. Economic constraints.	Eze et al., 2021; Owoade & Olatunji, 2020
Benin	Vaccination against avian influenza is implemented. Vaccination against Newcastle disease.	Introduction of new vaccines for emerging diseases. Farm sanitation practices. Quarantine measures for new birds.	Community vaccination initiatives. Use of local veterinary practitioners.	Logistical issues exist. Inconsistent biosecurity across farms. Community awareness is low. Predominantly smallholder farms with shared facilities. Lack of surveillance and monitoring; market access issues. Inconsistent vaccine supply. Resistance to modern practices. Limited government support	Dedehouanou et al., 2020
Sierra Leone	Vaccination against NCD, AI, and Marek's disease.	Focus on improving vaccination coverage. Biosecurity training for farmers. Regular monitoring of flock health.	Reliance on traditional medicine. Community awareness programs.	Supply chain issues exist. Low implementation of biosecurity; farms are often located in crowded areas. Traditional family-run farms; informal sector dominates. High mortality rates due to disease; and lack of farmer education. Infrastructure challenges. Limited access to veterinary services. Economic instability affecting poultry farming	Abidoye et al., 2022; Sulaiman & Ibrahim, 2022.

Ivory Coast	Vaccination against NCD, AI, and Gumboro disease.	Use of combined vaccines. Strict biosecurity protocols on commercial farms. Health monitoring of poultry.	Informal farmer cooperatives for knowledge sharing. Use of local veterinary services.	Political instability impacting agricultural policies. Limited financial resources for vaccine procurement. High prevalence of diseases. Inadequate extension services.	Gbala, 2019; Kone & Kouadio, 2021
Liberia	Vaccination against NCD and AI.	Focus on enhancing vaccination coverage. Farm biosecurity measures. Regular health assessments.	Traditional poultry management practices. Community-driven vaccination campaigns.	Limited vaccination against common poultry diseases; low compliance among farmers. Biosecurity practices are virtually non-existent. Reliance on local markets for poultry. Poor access to veterinary services. High disease vulnerability. Poor infrastructure. Lack of trained veterinary personnel. Economic Challenges Affecting Poultry Production.	Yao & Zohoun, 2020
Burkina Faso	Vaccination against NCD, AI, and Gumboro disease.	Seasonal vaccination campaigns. Biosecurity training for farmers. Monitoring and surveillance of poultry health.	Use of local herbs and traditional practices for disease management.	Efforts to introduce vaccinations; struggles with distribution. Biosecurity is mostly lacking; farmers are often unaware. Traditional methods of poultry raising are still prevalent. Economic limitations hinder health initiatives. Limited access to modern veterinary services. Resistance to vaccination.	Ouédraogo & Hien, 2019
Mali	Vaccination campaigns for major diseases; Vaccination against NCD and AI	Emphasis on awareness campaigns. Biosecurity measures in commercial farms. Monitoring and reporting of disease outbreaks.	Community engagement in poultry health management. Use of local veterinary services.	Challenges with logistics. Low biosecurity awareness among farmers. Approximately 80% of poultry farming is small-scale. Poor infrastructure; socio-economic challenges affecting farming. High disease prevalence. Poor infrastructure. Economic instability	Sidibe & Traoré, 2021

1.6.3. Stakeholder engagement

Limited stakeholder engagement in policy-making hinders the identification of industry-specific challenges and targeted solutions, highlighting the importance of involving farmers, industry associations, and government agencies.

1.7. Lack of skilled manpower

vocational training and knowledge transfer programs can address west africa's poultry industry shortage in disease management, nutrition, and farm management by addressing limited training opportunities and brain drain.

Findings

The review's findings can significantly aid policymakers, industry stakeholders, and researchers in addressing market access barriers and promoting a competitive and sustainable chicken business in West Africa. The West African poultry

sector faces significant challenges in obtaining high-quality and sufficient feed, which is crucial for its growth and productivity.

Potential solutions

The poultry industry in West Africa faces pressing issues like disease outbreaks, necessitating veterinary intervention to reduce losses. Ensuring easy access to veterinary services is crucial for reducing industry-wide disease rates Ajala et al. (2007). To boost rural poultry production in West Africa, extension workers need to be educated and trained to teach bird care to farmers with lower education levels Ajala et al. (2007). Additionally, small-scale layer poultry farmers need assistance in establishing or joining cooperative societies for loans and cooperation between authorities Aromolaran et al. (2013). Cooperative poultry farmers are better positioned to invest in their businesses and the industry. Aromolaran et al. (2013) recommend capacity education for modern farming and commercialization of small-scale layer chicken production. Adeyemo and Onikoyi et al. (2012) advocate for government assistance in tender loans. Anosike et al. (2015) suggests frequent inspections of hatchery businesses to lower death rates and improve day-old chick health. They also suggest West African governments subsidize feed costs for poultry farmers, allowing them to invest in high-quality feed and concentrate on healthy bird growth. This would reduce imports and improve local production. Exogenous enzymes and feed additives are increasingly used to lower feed costs and improve bird digestibility (Mateos et al., 2012). To prepare for increased demand, government and non-government organizations should collaborate on public-private partnerships. Professional trainers can provide workshops and seminars. Protecting domestic markets can be achieved through countervailing charges on imported chicken products, updating veterinary regulations, and encouraging dialogue between stakeholders. To tackle West Africa's poultry industry challenges, a comprehensive strategy involving disease surveillance, infrastructure development, finance access, market expansion, and vocational training is needed. Improving infrastructure, providing finance and capacity-building programs, strengthening regulatory frameworks, promoting market information systems, and implementing supportive policies are essential for enhancing production efficiency, supporting small-scale farmers, and promoting market competitiveness. The studies suggest several solutions to improve West Africa's poultry industry, including off-grid electricity access, water management systems, transportation infrastructure investment, and housing structures for birds, to enhance production efficiency, reduce costs, and improve bird health and productivity. The studies suggest addressing limited finance access in West Africa's poultry industry by establishing specialized institutions, providing credit facilities, implementing financial literacy programs, and promoting investment opportunities and partnerships with private sector stakeholders. The research suggests solutions to the West African poultry sector's market access issue, including infrastructure development, enforcing uniform quality standards, creating market information systems, and implementing supportive regulations. Infrastructure can reduce costs, improve market connections, and increase consumer confidence. Supportive policies, like import restrictions and trade facilitation measures, can protect local businesses. To improve feed availability, the industry should enhance production, promote sustainable agriculture, and diversify feed sources. Potential remedies to the feed scarcity problem in the chicken business include promoting alternate feed sources, providing resources and training to small-scale farmers, setting up regional feed banks, and funding research and development. The urgent necessity to address feed scarcity in the West African chicken business is emphasized by this review. Putting into practice all-encompassing plans that emphasize regional production, research, and cooperation can assist in achieving self-sufficient feed systems and support industry expansion. Increased local production and import diversification of feed ingredients, promotion of feed processing and storage facilities, quality control measures, and supportive policies can reduce dependency on imports and improve feed availability.

Discussions

The review emphasizes the need for improved policy coherence, enforcement mechanisms, and stakeholder engagement in West Africa's poultry industry. It suggests aligning regulations, strengthening enforcement mechanisms, and fostering inclusive policy-making processes. The review also calls for improved infrastructure, including access to electricity, clean water, transportation, and housing. It calls for collaboration between government agencies, private sector stakeholders, and international organizations to address infrastructure gaps and promote sustainable growth. The review also highlights the urgent need for enhanced financial access to the industry, addressing financial constraints like inadequate collateral, high interest rates, complex loan applications, and limited financial literacy among farmers. Sustainable solutions for feed scarcity include local ingredient production, facility upgrades, and research, requiring cooperation between government agencies, industry stakeholders, and international organizations. This systematic review highlights the need for improved policy coherence, enforcement mechanisms, and stakeholder engagement in West Africa's poultry industry. It suggests aligning regulations, strengthening enforcement mechanisms, and fostering inclusive policy-making processes to promote compliance and fair competition. This review highlights the urgent need for improved infrastructure in West Africa's poultry industry, including access to electricity, clean water, transportation, and housing, and calls for collaboration between government agencies, private sector stakeholders, and international

organizations. This review offers crucial insights for policymakers, industry stakeholders, and researchers to tackle infrastructure gaps and foster a sustainable and competitive poultry industry in West Africa. This systematic review aims to identify key infrastructure issues in West Africa's poultry industry, enabling stakeholders to develop targeted interventions, policies, and strategies to overcome gaps and promote sustainable growth. This systematic review underscores the urgent need for enhanced financial access to the West African poultry industry, thereby addressing the challenges faced by poultry entrepreneurs. The poultry industry in West Africa faces significant financial constraints due to factors like inadequate collateral, high interest rates, complex loan applications, and limited financial literacy among farmers. Poor market access in West African poultry businesses hinders farmers' earnings, profitability, and growth, limiting competitiveness and potential for investments in modern technologies and domestic and foreign markets. Sustainable solutions for feed scarcity include local ingredient production, facility upgrades, and research, requiring cooperation between government agencies, industry stakeholders, and international organizations for long-term solutions.

Conclusion

The West African chicken sector faces challenges like disease outbreaks, inadequate infrastructure, financing restrictions, poor market access, and labor shortages, necessitating coordinated efforts from policymakers, farmers, and stakeholders for sustainable growth. The poultry industry in West Africa faces numerous challenges that necessitate collaboration among stakeholders, policymakers, and international organizations. The region can unlock its poultry sector's potential for sustainable growth and development by enhancing biosecurity measures, enhancing quality input access, strengthening infrastructure, and implementing supportive policies. Disease outbreaks in West Africa's poultry industry, such as avian influenza, Newcastle disease, and infectious bursal disease, cause high mortality rates, trade restrictions, and economic losses. Controlling these requires improved surveillance, biosecurity, vaccination programs, and collaborations. The poultry industry in West Africa faces significant challenges due to inadequate infrastructure. Improving access to electricity, clean water, transportation, and housing is crucial for growth. Collaborative efforts between stakeholders are needed for long-term sustainability. The West African poultry industry faces challenges like disease management, market access, infrastructure, feed availability, and policy issues. A holistic approach involving policymakers, stakeholders, and researchers can contribute to sustainable growth. The West African poultry industry faces challenges like disease outbreaks, inadequate infrastructure, limited finance, and weak policy frameworks. Addressing these requires improved disease control, infrastructure development, enhanced finance, strengthened policy frameworks, partnerships, and technical support. The poultry industry in West Africa faces significant challenges due to policy and regulatory issues. Addressing these requires improving coherence, strengthening enforcement, fostering stakeholder engagement, and collaborating with government agencies, industry associations, and international organizations. This systematic review underscores the urgent need for enhanced market access in West Africa's poultry industry, addressing challenges faced by farmers such as inadequate infrastructure and inconsistent quality. The challenge is crucial for sustainable growth, improving farmers' livelihoods, and meeting the growing demand for poultry products in the region. The poultry industry in West Africa faces significant challenges due to inadequate infrastructure, including transportation, storage, processing, and energy supply, leading to increased costs and reduced market share. Collaborative efforts from policymakers, financial institutions, and industry stakeholders are needed to address limited finance access in the West African poultry industry. The West African poultry industry can be revitalized through a comprehensive strategy that includes infrastructure enhancement, improved transportation networks, cold storage facilities, and supportive policies.

Recommendations and future directions for improving the poultry industry in West Africa

To address the multifaceted challenges facing the poultry industry in West Africa and to unlock its potential for sustainable growth, the following concrete recommendations and future directions are proposed:

1. Strengthening biosecurity and disease management:

Implement Comprehensive Vaccination Programs: Governments and poultry associations should collaborate to develop and fund vaccination campaigns against prevalent diseases such as avian influenza, Newcastle disease, and infectious bursal disease. This can include mobile vaccination units to reach rural farmers. **Enhance Surveillance Systems:** Establish robust disease surveillance and reporting systems that enable timely detection and response to outbreaks. **Training local veterinarians and farmers in biosecurity practices** is essential for effective disease management.

Promote Research and Development: Encourage research institutions to focus on developing disease-resistant poultry breeds and innovative disease control methods. Public-private partnerships can facilitate funding for these initiatives.

2. Infrastructure development:

Invest in Transportation and Cold Chain Logistics: Governments should prioritize the development of reliable road networks and cold storage facilities to reduce post-harvest losses and improve market access. Collaborations with international organizations can provide necessary funding and expertise. **Enhance Energy Supply:** Implement renewable energy solutions, such as solar power, to provide reliable electricity for poultry farms and processing facilities. This can help reduce operational costs and improve productivity.

Improve Water Supply and Sanitation: Ensure access to clean water for poultry farming through public investments in water supply systems and sanitation facilities, which are crucial for bird health and productivity.

3. Access to finance:

Develop Tailored Financial Products: Financial institutions should create specialized loan products for poultry farmers, including lower interest rates and flexible repayment terms. This can help small-scale farmers access the capital needed for expansion and modernization. **Promote Financial Literacy Programs:** Implement training programs for farmers on financial management, loan application processes, and investment strategies to enhance their ability to secure funding and manage their finances effectively.

Encourage cooperative models: Support the formation of poultry cooperatives that can pool resources, share knowledge, and access financing collectively, thereby reducing individual risks and improving bargaining power.

4. Market access and trade facilitation:

Enhance Market Information Systems: Establish platforms that provide farmers with up-to-date market information, including pricing, demand trends, and buyer contacts. This can empower farmers to make informed decisions and negotiate better prices. **Promote Local Consumption:** Implement campaigns to encourage local consumption of poultry products, reducing dependency on imports and fostering a more resilient local market.

Address Trade Barriers: Work with regional trade organizations to eliminate unnecessary tariffs and non-tariff barriers that hinder local poultry producers from competing effectively in the market.

5. Policy and regulatory frameworks:

Strengthen Regulatory Compliance: Governments should enhance the enforcement of existing regulations related to poultry production, health standards, and food safety to ensure a level playing field for all producers.

Foster Stakeholder Engagement: Establish platforms for regular dialogue between farmers, policymakers, industry associations, and international organizations to collaboratively address challenges and develop effective policies.

Implement Supportive Policies: Develop and enforce policies that support sustainable poultry production, including subsidies for feed, incentives for disease management practices, and funding for infrastructure projects.

6. Capacity building and training:

Vocational Training Programs: Establish training programs focused on modern poultry farming techniques, biosecurity measures, and disease management, targeting both new and existing farmers to enhance their skills and knowledge.

Encourage Knowledge Transfer: Facilitate partnerships between experienced farmers and new entrants to promote mentorship and knowledge sharing, which can help improve productivity and sustainability.

Future Directions

- **Sustainable Practices:** Encourage the adoption of environmentally sustainable practices in poultry farming, such as organic feed production and waste management systems, to minimize the ecological footprint of the industry.
- **Technological Innovation:** Invest in technology transfer initiatives that introduce innovative farming techniques, automation, and digital tools to enhance productivity and efficiency in poultry production.

- Regional Collaboration: Foster collaboration among West African countries to create a unified poultry sector that can share resources, knowledge, and best practices, ultimately leading to improved competitiveness on a global scale.

Author contributions

Maxwell Ansong Okai, Francis Kruenti, and Jacob Alhassan Hamidu conceived the research idea, Maxwell Ansong Okai and Akua Durowaa Oduro-Owusu wrote the introduction and the Abstract. Theresah Nkrumah, Achiamaa Asafu-Adjaye Koranteng, and Benjamin Adjei Mensah wrote the sections from other literature, Jacob Kokou Tona, Vida Korkor Lamptey, Gabriel Adu-Aboagye proofread the first draft manuscript and Hai Lin read the final manuscript and edited the final manuscript before submission.

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It is declared that the authors didn't use AI and related tools to write this manuscript.

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