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Report of Policy Lab on
Bridging Gaps in
Agriculture Development Policies and their Implementation in Pakistan

پاکستان میں زرعی ترقی کی پالیسیوں
کے اطلاق میں حائل رکاوٹوں کا خاتمہ

Policy Analysis & Recommendations- Part-3 of 11

Enhancing Share Halal Meat Export

Pathways to leverage Pakistan's strength in halal meat production for greater penetration in international markets.

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بِسْمِ اللّٰہِ الرَّحْمٰنِ الرَّحِیْمِ

إِنَّ اللَّهَ لَا يُغَيِّرُ مَا بِقَوْمٍ حَتَّىٰ يُغَيِّرُوا مَا بِأَنفُسِهِمْ

(سورة الرعد 13:11)

بے شک، اللہ کسی قوم کی حالت نہیں بدلتا جب تک وہ خود اپنی حالت کو نہ بدلے۔

Indeed, Allah does not change the condition of a people
until they change what is in themselves.
(Surah Ar-Ra'd 13:11)

ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَسَبَتْ أَيْدِي
النَّاسِ لِيُذِيقَهُمْ بَعْضَ الَّذِي عَمِلُوا لَعَلَّهُمْ يَرْجِعُونَ

(سورة الروم 30:41)

خشکی اور تری میں فساد ظاہر ہو گیا ہے، لوگوں کے اپنے ہاتھوں کے کیے ہوئے اعمال کی وجہ
سے، تاکہ اللہ انہیں ان کے کچھ اعمال کا مزہ چکھائے، شاید کہ وہ باز آ جائیں۔

Corruption has appeared on land and sea because of
what the hands of people have earned, so that
He may let them taste part of what they have done,
that perhaps they will return (to righteousness).
(Surah Ar-Rum 30:41)

Enhancing Pakistan's Share in International Halal Meat Export

Explored pathways to leverage Pakistan's strength in halal meat production for greater penetration in international markets.

Research Group

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- Wasif Rehman
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PREFACE

Agriculture remains the backbone of Pakistan's economy, providing livelihoods to a significant portion of the population and contributing substantially to the nation's GDP. However, despite its potential, the sector faces persistent challenges related to productivity, resource management, and international trade. In response to these pressing issues, a ***Policy Lab*** simulation exercise titled **"Empowering Agriculture for Food Security and Economic Growth: Implementation Strategies in Pakistan"** was conceived, designed, and mentored by **Dr. Muqeem Islam Soharwardy**. This Policy Lab initiative aimed to generate actionable policy recommendations through an intensive, research-based simulation exercise complemented by a two-day seminar.

The ***Policy Lab*** research exercise, conducted between **14th and 18th February 2024**, involved nine specialized research groups, each focusing on critical aspects of agricultural policy. These groups simulated high-level policy interventions, functioning as dedicated task forces and committees under the guidance of subject matter experts. Their work culminated in a comprehensive set of recommendations aimed at addressing structural inefficiencies and unlocking new growth avenues in Pakistan's agricultural sector.

The a Policy Lab research groups were structured as follows:

1. **Expanding Trade Opportunities by Unleashing Pakistan's Milk Export Potential** – Focused on identifying barriers to dairy exports and proposing strategic interventions to enhance Pakistan's competitiveness in the global dairy market.
2. **Development of Pakistan's Fisheries Sector** – Examined strategies to modernize fisheries, improve sustainability, and enhance exports.
3. **Increasing Pakistan's Share in International Halal Meat Export** – Explored pathways to leverage Pakistan's strength in halal meat production for greater penetration in international markets.
4. **Provision of Quality Fertilizer to Enhance Productivity** – Investigated fertilizer supply chain challenges and policy measures to ensure the availability of high-quality inputs for farmers.
5. **Provision of Quality Seeds to Enhance Productivity** – Assessed Pakistan's seed industry, highlighting reforms needed to boost agricultural yields through high-quality seeds.
6. **Promoting Water Conservation in Agricultural Practices** – Addressed the critical issue of water scarcity by proposing conservation techniques and policy interventions for sustainable irrigation.
7. **Increasing Pakistan's Share of Fruit Exports** – Focused on expanding Pakistan's footprint in the global fruit market through improved production, value addition, and trade facilitation.

8. **Evaluation of Implementation Strategies of Food Security in Pakistan** – Analyzed the effectiveness of existing food security policies and proposed comprehensive strategies for improved implementation.
9. **Increasing Availability of Agricultural Credit** – Examined the role of financial institutions in supporting farmers and proposed mechanisms to enhance access to agricultural financing.
10. **Climate-Smart Agriculture**, Food Security, and Sustainable Land & Water Management explored innovative solutions for sustainable agriculture and resource management
11. **Agricultural Mechanization & Innovation –** Promoting modernized agriculture through mechanization, crop diversification, and precision farming.

Through rigorous research and a ***Policy Lab*** simulation, this exercise sought to foster a deeper understanding of the challenges and opportunities in Pakistan's agricultural sector. The insights and recommendations derived from these working groups will serve as a valuable resource for policymakers, stakeholders, and researchers striving to enhance agricultural productivity, food security, and economic growth in Pakistan.

We extend our gratitude to all participants, researchers, and experts who contributed to this initiative. Their dedication and intellectual rigor have resulted in a policy framework that holds the potential to transform Pakistan's agricultural landscape and position the country as a leading player in global agricultural markets.

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It is hoped that the recommendations and findings herein will contribute to **evidence-based policymaking, institutional capacity-building, and long-term agricultural growth**, ultimately fostering **national food security and economic stability**. انشاءالله.

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February 23, 2024

Executive Summary

Pakistan, with its vast agricultural resources and sizable Muslim population, holds considerable potential in the global halal meat market. The halal meat industry is burgeoning worldwide, driven by the increasing demand among both Muslim and non-Muslim populations, as the term "halal" has evolved into a brand synonymous with quality and safety. Despite this, Pakistan remains a minor player in the global halal meat market, ranking 19th with only a 0.4% share. The country faces several challenges that hinder its ability to fully capitalize on this growth opportunity, including outdated infrastructure, lack of policy alignment, and systemic inefficiencies. However, there are substantial opportunities for growth, especially in the Province of Punjab, where significant efforts are being made to improve the halal meat sector's production and export capacity.

The global halal meat market has witnessed significant growth, with a global meat market size of USD 511.5 billion and an annual growth rate of 6.3%. The growing Muslim population, projected to reach 2.2 billion by 2030, has driven the demand for halal meat across the globe. Pakistan, with its favorable climate and natural grazing pastures, is uniquely positioned to supply halal meat, especially beef, to international markets. While Pakistan’s meat production stands at 5.5 million tons annually, its market share in halal exports is underwhelming compared to its competitors, such as Brazil, Australia, and India. This is largely due to a combination of domestic challenges, such as diseases like Foot and Mouth Disease (FMD), outdated meat production processes, and a lack of robust institutional frameworks that support efficient production and export.

Pakistan's beef industry has the advantage of producing halal meat that is highly regarded for its hygienic nature and the organic food sources available to livestock. However, the halal meat export market remains limited, primarily focused on neighboring countries like Saudi Arabia, the UAE, and Kuwait, with beef representing more than 80% of the export share. Pakistan’s challenge lies in overcoming the barriers that prevent its halal meat sector from expanding further. These barriers include outdated slaughterhouses, lack of cold chain systems, insufficient certification practices, and bureaucratic red tape. These issues must be addressed to improve the quality of the meat and align with international standards, making Pakistan a more competitive player in the global halal meat industry.

Challenges and Underperformance

Despite Pakistan’s potential, its halal meat sector lags behind other major producers in the global market. A significant reason for this underperformance is the focus of Pakistan's livestock sector on dairy farming rather than meat production. As a result, many animals slaughtered for meat are primarily retired dairy animals, which do not meet the high standards required for global meat exports. Furthermore, Pakistan lacks value-added meat products, with the majority of its meat exports being in the form of chilled carcasses, rather than processed or frozen products that have greater value on the international market.

Another pressing issue is the lack of modernized slaughterhouses and meat processing facilities. Pakistan's current slaughterhouses do not meet international hygiene standards, which impedes the credibility of Pakistani meat in global markets. The absence of a traceability system and limited cold chain infrastructure further exacerbates these issues, raising concerns over the hygiene and quality of meat being exported. Additionally, Pakistan's certifications for halal meat are often not in alignment with globally recognized standards, making it difficult for exporters to gain access to key international markets.

The supply chain of Pakistan's halal meat industry is also hampered by a range of logistical and regulatory hurdles. Bureaucratic inefficiencies and a lack of coordination between government bodies create significant delays in obtaining the necessary certifications and approvals required for export. The lack of facilities at airports for the proper handling and transport of halal meat, especially in terms of temperature control, further compromises the quality of exported products. These issues, combined with the prevalence of diseases like FMD, which prevent Pakistan from accessing lucrative markets like Europe, have significantly constrained the country's ability to capitalize on the global halal meat boom.

Opportunities and Strategic Directions

To overcome these challenges, Pakistan must adopt a multi-faceted approach that involves institutional reforms, infrastructure upgrades, and policy interventions to facilitate the growth of the halal meat sector. A key step is to introduce high-yielding livestock breeds that are suited for meat production. This will require a shift in focus from dairy farming to beef farming, supported by comprehensive training programs for farmers and stakeholders involved in meat production. Additionally, greater emphasis should be placed on developing value-added meat products to enhance export opportunities.

Upgrading slaughterhouses to meet international standards is essential for improving the hygiene and quality of meat. This includes the introduction of modern processing facilities, certification systems that align with global standards such as FSSC 22000, and the implementation of a traceability system that enhances the credibility of Pakistan's halal meat in international markets. A robust cold chain system, along with better transport facilities, must be developed to ensure that the quality of meat is maintained from slaughter to export.

Pakistan should also focus on increasing its participation in international trade fairs and export expos, where it can showcase its halal meat products and build connections with global importers. This will help increase the visibility of Pakistani halal meat and attract potential buyers from new markets. To support these efforts, the government should streamline bureaucratic processes, reduce procedural hurdles, and establish a centralized system for handling export certifications and approvals. Facilitating meat exporters through trade promotion initiatives, especially in target markets in the Middle East, Africa, and Europe, will be crucial for expanding Pakistan's halal meat export market share.

Furthermore, tackling issues such as the illegal smuggling of livestock to neighboring countries, like Afghanistan and Iran, will help stabilize local supply and ensure that more livestock is available for legitimate exports. Addressing the import dependency for cattle feed and improving the quality and availability of vaccines for livestock diseases will also help reduce costs and improve the overall health of Pakistan's livestock population.

Pakistan's halal meat sector possesses significant potential, yet it remains underdeveloped compared to other global players. Despite the country having substantial production capacity and a large Muslim population, its fragmented policies, outdated infrastructure, and unresolved issues like animal diseases continue to restrict its ability to expand its global market share. The focus of Pakistan's halal meat industry has been primarily on low-value meat exports, such as chilled carcasses, without developing value-added products that could attract higher demand in global markets. Furthermore, Pakistan struggles to meet international standards for certifications, quality control, and traceability, which hampers its ability to compete with leading halal meat exporters such as Brazil, Australia, and India.

Animal-related diseases, notably Foot and Mouth Disease (FMD), are a significant barrier to entry into developed markets like Europe. Without eradicating these diseases, Pakistan's access to high-value markets will remain limited. Additionally, the lack of a centralized database and traceability system prevents the country from enhancing the credibility of its meat products, making it harder to assure buyers about the quality and safety of the meat. These issues contribute to Pakistan's low global market share in halal meat, currently standing at only 0.4%, despite the increasing demand worldwide driven by the growing Muslim population.

Key Issues in the Halal Meat Sector

One of the core issues facing Pakistan's halal meat industry is the focus on dairy cattle farming rather than beef production. Most of the animals raised for slaughter in Pakistan are retired dairy animals, which do not meet the global demand for high-quality meat. Furthermore, Pakistan lacks significant value-added products in its export portfolio, focusing mainly on chilled carcasses rather than processed or frozen meat that could offer greater value and shelf life. This lack of diversification limits the potential for Pakistan to access more lucrative markets.

The absence of modern slaughterhouses also remains a challenge. Pakistan's existing slaughterhouses do not meet international food safety standards, which has led to poor hygiene practices and contamination risks. The lack of investment in updated facilities and technologies such as Hazard Analysis and Critical Control Points (HACCP) has contributed to substandard meat production processes. Moreover, Pakistan's cold chain system is inadequate, with limited infrastructure for temperature-controlled transportation and storage, which has resulted in spoilage during transport and export delays.

In addition to the infrastructure issues, the certification process in Pakistan is inefficient and fragmented. The lack of alignment with international standards for halal certifications and food safety has reduced the credibility of Pakistani meat in global markets. This creates barriers for meat exporters, as they must either navigate cumbersome bureaucratic hurdles or invest in acquiring globally recognized certifications independently, which adds to their operational costs.

Strategic Recommendations for Growth

To overcome these challenges and capitalize on the global demand for halal meat, several strategic recommendations have been put forward. These recommendations aim to modernize Pakistan's halal meat sector, enhance production quality, and expand its global market share.

1. **Development of Value-Added Products**: Pakistan should shift its focus toward the production of value-added halal meat products, such as processed meats, frozen products, and ready-to-cook meals. To support this, policies should be implemented to incentivize investment in the sector, facilitate access to technology and finance, and promote participation in international trade fairs and exhibitions. This will help diversify Pakistan's export portfolio and attract buyers from a wider range of global markets.
2. **Genetic Improvement of Livestock**: There is a need for genetic improvement of livestock, particularly through transgenic technologies. This can be achieved by establishing specialized laboratories and regulatory frameworks to ensure biosafety and public trust. Public-private partnerships (PPP) should be encouraged to fund the research and development of these technologies to increase livestock yield and meet the demands of global markets.
3. **FMD Control Programme**: Pakistan must establish disease-free zones for Foot and Mouth Disease (FMD) and focus on the production of high-quality vaccines and timely vaccination of livestock. A national FMD control program should be launched in collaboration with international organizations like the FAO, ensuring that disease management systems are in place to safeguard livestock and facilitate access to global markets, including Europe.
4. **Modernization of Slaughterhouses**: Modernizing slaughterhouses is critical for improving the hygiene and safety of Pakistan's meat exports. Investment in clean, modern facilities with proper ventilation, drainage, and waste disposal systems is necessary. The adoption of HACCP principles and certifications such as ISO 22000 and Global Standard for Islamic Meat (GIM) will ensure that meat produced meets international standards for halal and food safety requirements.
5. **Cold Chain and Traceability Systems**: The establishment of a robust cold chain and traceability system will significantly enhance the credibility of Pakistan's halal meat products. By using e-tags or RFID chips to track animals from birth to slaughter and integrating data collection systems across farms, slaughterhouses, and processing plants, Pakistan can ensure transparency and quality control. The development of a centralized database accessible to authorized stakeholders will further bolster trust in Pakistan's meat products.
6. **Cold Chain Facilities at Airports**: To address the issue of spoilage during transport, cold chain facilities should be established at airports to facilitate exporters. This will help maintain the quality of meat products during international shipments, especially in regions with hot climates.

7. **Centralized Certification System**: A single authority should be established to streamline the halal certification process, ensuring that certifications are aligned with international standards. This centralized body would handle all licensing and certification requirements, reducing delays and improving the efficiency of the certification process for exporters.

Implementation Framework and Action Plan

The successful implementation of these recommendations will require a coordinated effort across various stakeholders, including government ministries, private investors, and international organizations. Key action items include:

- **National FMD Control Programme**: Led by the Ministry of National Food Security and Research, with support from the Livestock and Dairy Development Department, this initiative will focus on the vaccination of livestock and establishing disease-free zones. A detailed surveillance network and diagnostic laboratories will be essential to monitor and control the spread of FMD.
- **Animal Identification and Traceability System**: This initiative, led by the Ministry of National Food Security and Research and the Livestock and Dairy Development Department, will involve the implementation of mandatory animal tagging and the development of a national database. The traceability system will ensure that meat products are tracked from the farm to the consumer, improving transparency and safety.
- **Cold Chain Management**: Private sector investments will be essential to expand cold storage facilities and implement real-time temperature monitoring systems. Public sector involvement, particularly from the Ministry of National Food Security and Research, will be necessary to develop the infrastructure needed to support a nationwide cold chain system.
- **Modernization of Slaughterhouses**: The modernization process will require both public and private investments. Government bodies such as the Ministry of National Food Security and Research, in collaboration with local municipal administrations, will oversee the implementation of new slaughterhouses meeting international standards.

Conclusion

Pakistan’s halal meat sector is at a critical juncture, where significant reforms and investments are necessary to unlock its full potential in the global market. Despite its favorable natural resources and positioning as a halal food producer, the country faces numerous challenges that limit its competitiveness. By addressing key issues such as outdated infrastructure, lack of value-added products, inadequate certification, and the absence of a robust cold chain and traceability system, Pakistan can significantly improve its export performance in the halal meat sector. Strategic investments, coupled with supportive government policies and international collaboration, are essential for positioning Pakistan as a leading player in the global halal meat market.

Introduction

The term halal refers to the meat that is prepared under Islamic dietary practices (Saleem, 2023). The Muslim population of the world is currently 1.8 billion, which is expected to rise to 2.2 billion by 2030. The growing Muslim population is also increasing the demand for halal meat (Norshazila, Siti, & Azura, 2023). Nowadays, the concept of halal is not only limited to a religious belief but is also accepted as a brand in global markets (Wilson & Liu, 2010). Presently, the global meat market stands at 511.5 billion USD with an annual growth rate of 6.3%.

The Economic Survey of Pakistan, 2022-23, estimates that the total meat production of Pakistan is 5,504,000 tons, in which the contribution of beef is 2,544,000 tons. Similarly, the share of mutton and poultry is 799,000 and 2,160,000 tons, respectively. Pakistan's beef market strength is the availability of halal meat in the country, and it is liked in Muslim and non-Muslim countries due to its hygienic nature. According to the literature, the quality of Pakistani mutton is better than that of Indian and Australian, due to its natural pastures and organic food (Shafiq, Malik, Bano, & Azhar, 2019).

During the last decade, the government of Pakistan has shown interest in increasing livestock production and developing processing facilities to fulfill the increasing local and global halal meat demand. In Pakistan, the main sources of halal meat are buffaloes, goats, sheep, poultry, and camel (Sohaib, Muhammad; Jamil, Faraz, 2017). Various institutional frameworks such as the Punjab Agriculture and Meat Company (PAMCO) and the livestock wing of the Ministry of National Food Security and Research are working on the production, processing, and export of halal meat. All Pakistan Meat Exporters and Processors Association (APMEPA) is a trade body that supports and promotes the meat sector at the local and global level. Punjab is taking a leading role in developing strategies to enhance the livestock industry for a sizeable share in the global halal food market. Being the largest province, it is attracting maximum foreign investors due to improving opportunities in the halal meat sector (Profit, 2023).

Due to its geographical proximity to the Middle East, Pakistan stands poised to capitalize on the halal meat industry, offering significant potential to enhance the country's overall economic security. However, several challenges have restrained Pakistan from fully harnessing this sector's potential. Despite being a Muslim country, Pakistan is far behind non-Muslim countries such as Brazil, Australia, India, and the USA, which are the leading halal meat exporters in the global market. Pakistan ranks 19th in the list with only a 0.4% share in the global market (Profit, 2023). Pakistan is a brand for producing halal food among Islamic countries due to the taste of halal meat and natural food pastures for animals. Pakistan exports halal meat mainly to Saudi Arabia, the UAE, Uzbekistan, and Kuwait, among other countries, with beef's share of more than 80%. Pakistan's export market is limited due to Foot and Mouth Disease (FMD), traditional methods of meat production, and a lack of investor-oriented policies. The absence of a policy focus on meat production creates supply-side issues such as the unavailability of proper infrastructure, informal meat production processes, nutritional constraints, immature dietary practices, transport facilities, and informal slaughterhouses, etc. (SBP, 2022).

Problem Statement

With a growing global population, the demand for halal meat is increasing in both Muslim and non-Muslim countries. Despite boasting a sizeable Muslim population and sufficient animal resources, Pakistan remains a marginal player in the booming global halal meat market. This glaring underperformance necessitates immediate research to identify the underlying causes that place Pakistan far behind its competitors. This paper aims to analyze those factors and causes to propose effective policy interventions.

Scope of the Study

This paper analyzes the halal meat market of Pakistan with a special focus on its export potential, specifically in the Province of Punjab. It conducts a situational analysis of beef production in Punjab, relevant organizational structures, PAMCO's role/organizational capacity, and halal certification with relevant laws and policies to prepare an operational plan for increasing the export of halal meat. This study holds significance for Pakistan's economic growth and its position in the global halal meat market. It has the potential to unlock economic benefits for Pakistan by addressing critical challenges in the halal meat sector.

Research Methodology

Both primary and secondary data have been acquired to write this paper. Primary data has been acquired through semi-structured interviews conducted with relevant stakeholders. Secondary data has been acquired from research journals, reports, case studies, official websites of different organizations, and newspaper articles. A mixed-methods research design has been used, relying on both qualitative and quantitative analysis.

For the analysis part, situational, gap, fishbone, and PESTLE analyses have been used. Similarly, a comparison of Pakistan with a developing country, i.e., India, and a developed country, i.e., Brazil, has been conducted to assess the causes and issues of Pakistan's low halal meat exports.

Literature Review

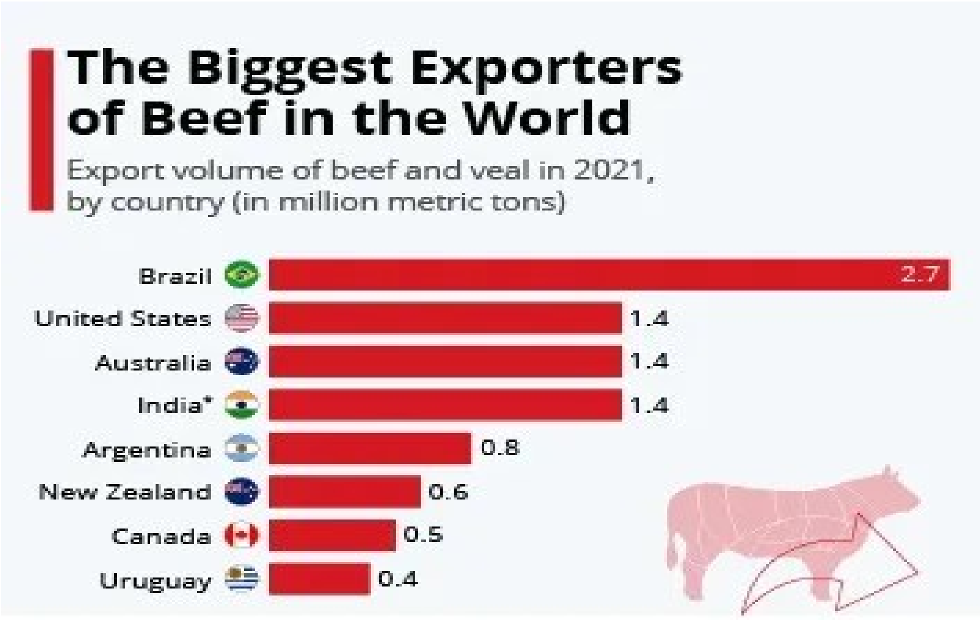
The demand trend for halal meat and meat-based products among Muslims worldwide has increased in recent years. Norshazila et al. (2023) claim that the awareness among non-Muslims of halal meat and meat-based products is due to their high quality and safety, thus resulting in more access to halal meat and meat-based products for them. They argue that the term “halal” has become a brand which attracts not just Muslims but non-Muslims as well.

A sustainable and traceable food supply chain is one of the major strategies that businesses all around the world have adopted to provide customers with quality food and to remain competitive in the global market. Many industrialists, researchers, and economists have focused on food quality because of the high importance of this issue in the global meat markets context. Noor et al. (2022) highlighted the importance of traceable food supply chains in enhancing the credibility and integrity of exporters worldwide.

Dairy farming is prevalent in Pakistan, and only draught or retired animals are slaughtered. Habibullah et al. (2020) suggest that high-yielding livestock breeds should be introduced to farmers, followed by comprehensive training programs for all stakeholders involved in meat production. This would foster the culture and practice of beef farming and increase the population of livestock for export purposes as well. They have suggested that registered and corporate livestock farming is the only solution to fulfill the required standards of raw and processed meat in the global halal meat market.

Analysis

Global Leaders in Export of Halal Meat



Source: (MeatNister, 2021)

Situational Analysis of Meat Production in Punjab

Punjab contributes around 60% towards Pakistan's beef production (Khan N. H., 2020). The total Cattle and Buffalo population is 100.5 million whereas the Sheep and Goat population is 117 million (Finance Division, 2023).

Types of Animals slaughtered:

- **Poultry:** Punjab is the largest contributor of poultry products in Pakistan, accounting for 75% of the total production (Trade, 2024).
- **Buffalo:** Buffalo is a major red meat source, and Punjab's share in the total beef production of Pakistan is 43% (Trade, 2024). Most of the slaughtered animals are usually draught or retired dairy animals.
- **Cattle:** It contributes around 30%, comprising local breeds such as Sahiwal and Dhani, known for milk production and draught purposes. Efforts are underway to develop beef breeds such as Cholistani (Ali T. A., 2020).
- **Goats and Sheep:** They contribute around 37% and 24%, respectively, to the total production of goat and sheep meat in Pakistan (Trade, 2024).

Slaughtering Conditions:

- **Mostly Traditional:** A substantial portion (around 60 to 70%) of slaughtering takes place in small, unregulated, and unmonitored butcher shops and even homes, which raises serious hygiene concerns (Ahmad U. &., 2021).
- **Lack of modern facilities:** Modern slaughterhouses with proper temperature

control, sanitation, and veterinary inspection exist but are insufficient (Shafique, 2015).

- **Animal welfare concerns:** Lack of humane handling, overcrowding, and pre-slaughter stress prevail in existing traditional settings, which raise concerns over meat quality and ethical considerations.

Quality of Meat

- **Considerable variability:** Weaker quality control mechanisms raise concerns about consistency of quality and meat safety (Arshed Bashir, 2015).
- **Inadequate Cold Chain infrastructure:** There are insufficient cold storage facilities, which contributes to quality loss and spoilage, particularly in rural areas and smaller towns (Akhtar, 2019).
- **Concerns about hygiene:** Inadequate infrastructure and traditional methods raise concerns over the presence of zoonotic diseases and microbial contamination (Jamil & Sohaib, 2017).

Extent of Processed Meat:

- **Limited Industry:** The processing industry is underdeveloped, and most of the meat is consumed fresh (Jamil M. S., 2017). Statistics reveal that around 90% of the meat consumed in Pakistan is fresh meat (Jalil & Ahmad, 2022).
- **Focus on some basic products:** Existing meat processing facilities focus mainly on burgers, sausages, and kebabs, etc. (Sohaib & Jamil, 2017).
- **Limited trust and consumer awareness** in processed meat due to hygiene and safety concerns (Ahmad, et al., 2013).

Relevant Organizational Structures

Punjab Agriculture and Meat Company (PAMCO):

- **Lack of Modernization:** PAMCO's processing facilities suffer from outdated technology and inadequate infrastructure, impacting efficiency and quality control.
- **Limited Halal Certification:** Inconsistent halal certification processes create credibility issues in international markets, restricting export opportunities.
- **Inadequate Market Research:** PAMCO's insufficient focus on market research results in ineffective market targeting and missed export opportunities.

Ministry of National Food Security and Research:

- **Bureaucratic Hurdles:** Slow policy implementation and bureaucratic red tape hinder initiatives aimed at improving the halal meat export industry.
- **Lack of Policy Alignment:** Inconsistent policies and regulations across ministries cause confusion, impeding the development of a cohesive export strategy.

All Pakistan Meat Exporters and Processors Association (APMEPA):

- **Limited Market Access:** APMEPA struggles to penetrate new markets due to resource constraints for market development and trade promotion.
- **Certification Challenges:** Ensuring consistent halal certification standards among members poses a challenge, leading to discrepancies in product quality and compliance.

Livestock and Dairy Development Department:

- **Weak Disease Control Measures:** Inadequate disease control programs and vaccination initiatives lead to outbreaks, such as Foot and Mouth Disease (FMD), restricting market access.

- **Insufficient Infrastructure:** Lack of investment in cold chain and traceability systems results in quality and safety concerns among international buyers.

Trade Development Authority of Pakistan (TDAP):

- **Limited Trade Promotion:** TDAP's efforts in promoting Pakistani halal meat abroad are far from satisfactory. Commercial Attachés posted on foreign missions can play a significant role in improving trading prospects.
- **Inadequate Market Intelligence:** TDAP's market intelligence capabilities are insufficient to identify and capitalize on emerging market trends and opportunities in the halal meat sector.

Pakistan Halal Authority (PHA):

- **Certification Discrepancies:** PHA's halal certification processes lack standardization and transparency, undermining the credibility of Pakistani halal meat products globally.
- **Capacity Constraints:** PHA does not have the required staff to implement its mandate (Tahir U., Additional Secretary livestock Punjab, 2024).

Private Sector:

- **Lack of Innovation:** Many private sector entities in the halal meat industry fail to invest in research and development, resulting in limited product diversification and innovation.
- **Compliance Issues:** Some exporters and processors struggle to meet international quality and safety standards, leading to rejections and restrictions in key export markets.

Financial Institutions:

- **Limited Access to Financing:** Small and medium-sized enterprises in the halal meat sector face challenges in accessing affordable financing for infrastructure upgrades and capacity building.
- **Risk Aversion:** Financial institutions may be hesitant to provide loans to halal meat exporters due to perceived risks associated with the industry, constraining investment and growth.

Overall, the complex organizational structure of Pakistan's halal meat export industry is plagued by numerous challenges, including outdated infrastructure, inconsistent certification processes, policy fragmentation, and limited market access. Addressing these structural issues will require concerted efforts from all stakeholders, including government agencies, industry associations, and private sector entities, to streamline processes, enhance capacity, and improve market competitiveness.

Analysis of Relevant Laws and Policies Supporting Halal Certification

Pakistan Halal Authority Act 2016

The Act assigns duties and responsibilities to the Pakistan Halal Authority to develop and implement strategies and plans for the promotion of imports and exports. The Pakistan Halal Authority has been established under the Ministry of Science and Technology and is responsible for checking halal standards for articles and processes, issuing halal logos, operating a certification body after accreditation, renewing halal certifications, conducting testing and inspections of halal products, and coordinating with national and international organizations (such as FAO) to strengthen the halal meat sector.

The Punjab Halal Authority registers slaughterhouses as per the laws and regulations laid down by the federal government. The federal government has also tasked the Pakistan

Standards and Quality Control Authority (PSQCA) with providing technical support and guidance on halal food manufacturing processes, such as inspection of facilities, monitoring of product quality, and ensuring labeling requirements. However, there are two main issues: overlapping functions between the Pakistan National Accreditation Council (PNAC) and the PHA, and the inability of the PHA to hire the required personnel.

Role of Punjab Agriculture and Meat Company (PAMCO)

PAMCO is working on formalizing the horticulture and meat sectors, i.e., production, processing, and marketing (inland and export), complying with international quality standards. However, PAMCO's performance is far from satisfactory. Initially built to export meat to Iran with Iranian funding, Pakistan couldn't fulfill this due to US sanctions. Currently, Pakistan is repaying the Iranian investment. For around six years, PAMCO has operated without a CEO.

Under PAMCO's purview, the following programs have been executed:

- **Lahore Meat Processing Complex (LMPC):** This state-of-the-art facility, a flagship PAMCO project, offers slaughtering lines for beef and mutton, value-added products, meat processing facilities, supply to the global halal market, and a cooling system. Yet, no meat exports have originated from here.
- **Save the Calf Scheme:** To address the high calf mortality rate and inefficient meat production, this program provides monetary grants and free vaccinations to farmers for each saved calf.
- **Feedlot Fattening:** This initiative aims to improve meat yield by providing incentives to farmers, including registration, training, veterinary services, financial support, and certification.

Currently, the Punjab Livestock and Dairy Development Department oversees the "Save the Calf" and "Feedlot Fattening" programs. Despite attempts to contact PAMCO officials, their responses were inadequate. No significant achievements or challenges were shared. Furthermore, no research journals, papers, or case studies have highlighted PAMCO's contributions. A senior official from the Punjab Livestock Department deemed PAMCO's role in promoting halal meat exports as insignificant.

Cause and Effect (Fishbone) Analysis

Problem

Pakistan, despite having significant potential, remains behind leading Halal meat exporters like Brazil, the USA, Australia, and India.

Main Branch

Low Halal Meat Exports

Sub-branches

Infrastructure & Technology:

- Outdated slaughterhouses and processing facilities: Lack hygiene, quality control, and efficiency.
- Limited cold chain and traceability systems: Reduce product integrity and transparency (Noor, Usman, & Shahid, 2022).
- Inadequate research and development: Hinders innovation and value-added product development. Lack of investment in genetic improvement of livestock.

Certification & Standards:

- Limited international recognition of HCA certification: Creates market access hurdles.

- Inconsistent implementation of Halal standards: Raises concerns about quality and compliance.
- Lack of transparency and harmonization in certification procedures: Creates confusion and complexity.

Market Access & Promotion:

- Inadequate marketing and branding efforts: Low awareness of Pakistani Halal meat in key markets.
- Limited participation in international trade fairs and events: Restricts market exposure and networking opportunities.
- Non-tariff barriers and strict import regulations: Imposed by major importing countries.

Policy & Governance:

- Slow implementation of government initiatives: Hinders progress and impact of programs.
- Bureaucratic hurdles and corruption: Discourages investment and slows down export processes.
- Unsustainable subsidy and price control policies: Distort markets and hinder competitiveness.

Social & Cultural:

- Limited focus on export potential: Domestic demand absorbs a significant share of production.
- Lack of consumer awareness about international Halal standards: Creates challenges in differentiation.
- Focus on Small-Scale Farming and not Beef Farming: Restricts exporting potential and participation.

Gap Analysis

Area	Current State	Desired State	Gap/Issues	Action Plan
Infrastructure and Technology	Outdated slaughterhouses, limited cold chain and inadequate R&D	Modern facilities, robust traceability systems and cutting-edge processing	Lack of investment and low technology adoption	Public Private Partnerships, Tax incentives for modernisation and funding for R&D
Biosecurity and Sustainability	Unsustainable practices and biosecurity concerns	Robust disease control measures and environmentally friendly practices	Potential market rejection due to sustainability concerns and animal health issues	**Promote sustainable practices:** Encourage adoption of eco-friendly methods throughout the value chain, enhance brand image and market appeal. **Strengthen biosecurity:** Implement robust disease control measures, invest in veterinary services, promote responsible

				antibiotic use.
Products Diversity	Lack of Value-added products	Diverse product offerings catering to specific market preferences	Limited market appeal, focus on raw meat exports	**Promote product diversification:** Support research & development for innovative Halal products (ready-to-cook meals, etc.), incentivize private sector investment in value-added processing.
HCA Certification	Limited international recognition of HCA certification	Internationally accredited and trusted Halal certification system	Market access hurdles due to lack of recognition	**Strengthen HCA:** Achieve international accreditation, ensure consistent implementation of Halal standards, build capacity of certification personnel.
Regulatory Compliance	Non-compliance with international regulatory practice and standards	Regulations aligned with major importing countries	Inconsistencies in regulatory practices and enforcement	Collaborate with importing countries to harmonize regulations; Establish a regulatory task force for trade compliance
Foot and Mouth Disease	Pakistan's export market is limited and restricted due to prevalence of Foot and Mouth disease.	Pakistan is moving towards gradual elimination of FMD and expanding its export market	Low vaccine production and the quality of vaccine is not at par with internationally acceptable standards	Establishment of disease-free zones for FMD and increase in the production of quality vaccines along with timely vaccination of livestock.
Stakeholders Collaboration	Fragmented industry with minimal collaboration amongst farmers, processors, exporters, and government agencies	Strong industry wise collaboration and information sharing.	Government is not playing an active role in connecting the different stakeholders and facilitating them	**Facilitate industry associations and platforms:** - Support the establishment and activities of industry associations representing various stakeholders. Create online platforms for information sharing, networking, and collaboration among stakeholders

Promotion of Beef Farming	Focus on Diary Farming and Beef farming discouraged.	Mostly draught or retired dairy animals are slaughtered.	Established Cattle Breed Farming	• Introduce programs for artificial insemination or crossbreeding with high-quality beef breeds. • select breeding stock based on desired traits like growth rate, feed efficiency, and carcass quality. • Support R&D programs

Stakeholder Analysis

Stakeholder	Power	Interest	Strategy
Ministry of National Food Security and Research	High	High	Build Strong Partnership: Address regulatory hurdles and increase liaison with private businesses for their facilitation
Trade Development Authority of Pakistan (TDAP)	Medium (Connections and Market Information)	High	Collaborate on marketing and trade promotion. Leverage TDAP's expertise utilize their platforms to participate in trade missions
Pakistan Halal Authority (PHA)	High (Certification Power)	High (Revenue generation & international recognition)	Strengthen collaboration and transparency, clarify procedures to address inconsistencies and ensure that certifications align with global requirements.
Financial Institutions	High	Medium	Develop targeted financing schemes and competitive loans to facilitate the private sector.
Livestock and Dairy Development Department	Medium (Disease control initiatives)	High (Preventing market disruptions & promoting animal health)	Collaborate on disease control programs and share data to ensure compliance and market access
Private Sector	Medium (Production and Market knowledge)	High (profitability and market access)	Facilitate and incentivize through reduction of bureaucratic hurdles, offering investment opportunities and promoting Public Private Partnerships
Consumer Protection Agencies	Medium (Regulatory Power)	High (Ethical practices and environmental sustainability)	Address safety concerns and share data on quality control measures.
International Trading Partners	High (Market access and trade agreements)	High (quality compliance and competitive pricing)	Understand their specific requirements and negotiate favorable trade agreements.

Comparison of Pakistan vs. India

Market Potential:

- **Global Demand:** Both countries benefit from the rising global demand for Halal meat, estimated at USD 1.9 trillion by 2024 (Allied Market Research, 2023).
- **Target Markets:** Pakistan enjoys closer geographical proximity to the Middle East and Central Asia, while India has a larger domestic Muslim population and potential in Southeast Asia (Trade Development Authority of Pakistan, 2022; APEDA, 2023).

Export Performance:

- **Pakistan:** Exports remain modest at around USD 430.89 million in 2022-23 (Trade Development Authority of Pakistan, 2023), despite its large livestock population.
- **India:** Exports reached USD 5.5 billion in 2022 (APEDA, 2023), showcasing its significant progress and potential.

Practices and Infrastructure:

- **Slaughterhouses:** India has invested heavily in modernizing slaughterhouses and cold chain infrastructure, while Pakistan faces challenges with outdated facilities (Jalil et al., 2022; Department of Animal Husbandry, Dairying & Fisheries, 2024).
- **Certification:** Both countries have government-backed Halal certification systems, but India's system enjoys wider international recognition (APEDA, 2023; Ministry of Science and Technology, 2023).
- **Processing:** India has a more developed processed meat industry, offering a wider variety of Halal products (Jalil et al., 2022).

Challenges and Opportunities:

- **Pakistan:** Needs to address infrastructure deficiencies, improve compliance with international standards, and enhance brand awareness (Livestock & Dairy Development Department, 2023).
- **India:** Needs to overcome religious sentiment-driven resistance to modern slaughter practices and ensure consistent product quality across its diverse states (APEDA, 2023).

Government Initiatives:

- **Pakistan:** National Priority Sectors Export Strategy, Halal Certification Authority, Save the Calf program (Trade Development Authority of Pakistan, 2022; Ministry of Science and Technology, 2023; Pakistan Agriculture & Meat Company, 2024).
- **India:** Halal Export Promotion Scheme, modernization of slaughterhouses, focus on research and development (APEDA, 2023; Department of Animal Husbandry, Dairying & Fisheries, 2024).

Comparison of Pakistan with Brazil

Market Potential:

- **Global Demand:** Both countries benefit from the rising global demand for Halal meat, projected to reach USD 1.9 trillion by 2024 (Allied Market Research, 2023).
- **Target Markets:** Brazil enjoys easier access to South American and Southeast Asian markets with large Muslim populations, while Pakistan is geographically closer to the Middle East and Central Asia (Trade Development Authority of Pakistan, 2022; Brazilian Association of Animal Protein, 2021).

Export Performance:

- **Brazil:** Boasts the world's largest Halal meat exporter title, with exports exceeding USD 8 billion in 2022 (BAAP, 2023).
- **Pakistan:** Exports remain modest at around 430 million in 2022 (Trade Development Authority of Pakistan, 2023), despite its large livestock population.

Practices and Infrastructure:

- **Slaughterhouses:** Brazil possesses a vast network of modern, automated slaughterhouses with stringent hygiene protocols (USDA Food Safety and Inspection Service, 2023). In contrast, Pakistan struggles with outdated facilities and inconsistent hygiene standards (Livestock & Dairy Development Department,2023).
- **Certification:** Both countries have government-endorsed Halal certification systems, but Brazil's enjoys wider international recognition and accreditation (Ali et al., 2020; Ministry of Science and Technology, 2023).
- **Processing:** Brazil has a highly developed processed meat industry, offering a diverse range of Halal products, while Pakistan's industry remains largely focused on fresh meat (Jalil et al., 2022).
- **Traceability:** Brazil implements a robust cold chain and traceability system, ensuring product integrity and transparency throughout the export journey (Brazilian Association of Animal Protein, 2021). Pakistan lacks a comprehensive traceability system for its Halal meat exports.

Challenges and Opportunities:

- **Brazil:** Needs to diversify its export markets and address concerns about potential deforestation linked to animal agriculture (MAPA - Ministry of Agriculture, Livestock and Supply, 2024).
- **Pakistan:** Requires significant investment in modernizing infrastructure, strengthening certification systems, and diversifying product offerings (Trade Development Authority of Pakistan, 2022).

Government Initiatives:

- **Brazil:** Employs a centralized and transparent Halal certification system, invests in research and development for disease control and vaccine production, and actively collaborates with international organizations (MAPA - Ministry of Agriculture, Livestock and Supply, 2024).
- **Pakistan:** Launched the National Priority Sectors Export Strategy, established the Halal Certification Authority, and implemented the Save the Calf program, but faces challenges in implementation and impact (Trade Development Authority of Pakistan, 2022; Ministry of Science and Technology, 2023; Pakistan Agriculture & Meat Company, 2024).

Insides and Takeaways from Interview

- Even our exports are import-dependent, which raises the cost of our products, thus rendering them less competitive in the global market. Other factors such as the high cost of POL, electricity, and persistent depreciation of the rupee against the dollar further add fuel to the fire (Khursheed D., Ex Animal Husbandry Commissioner, 2024).
- We cannot enter European and other developed markets due to the prevalence of FMD. Another major factor that impedes our entry into European markets is the use of outdated technology. Developed countries have strict quality control measures and demand testing of products through the latest equipment, which Pakistan does not have (Khursheed D., 2024).
- Our policies are not export-friendly and fail to keep pace with global requirements. Our breeding policy discourages beef cattle farming, whereas the situation demands an urgent transition to beef cattle farming to increase the indigenous production of beef. (Khursheed, 2024)
- Provincial Halal food authorities do not have the capacity to conduct quality control tests with reference to exporting meat. They can only check the composition but lack the technology to check the level of banned residues in meat. Global importers demand meat free from all sorts of toxic residues. (Khursheed, 2024)
- Traceability requires a national database like NADRA, where the government of Pakistan should be able to access data regarding livestock. The process is too cumbersome and expensive as it would require financial resources and infrastructure like NADRA, albeit on a relatively smaller scale. The government of Pakistan would require dedicated concerted efforts to make this happen. Currently, it does not seem likely (Khursheed, 2024).
- Pakistan has neglected genetic improvement of livestock, which has badly affected our productivity. We have restricted ourselves to certain indigenous breeds and have not experimented with new breeds. The reason why the poultry industry has flourished more than cattle is because of the genetic improving interventions undertaken there (Khursheed, 2024).
- The contribution of Livestock is around 63% in the agriculture sector, whereas our allocation to livestock in PSDP is less than 10% of the total sectoral allocation.
- Commercial attachés are not playing an effective role in promoting Pakistani products abroad. They could connect Pakistani businessmen with importers in the host countries and facilitate the export of Pakistani products. Similarly, they could share information about the requirements of importing countries to assist exporters in aligning themselves accordingly (Kakakhel, 2024).
- There are many stakeholders involved in the export of Halal meat, such as the Ministry of National Food Security and Research, Provincial Livestock Department, business community, Ministry of Commerce, Ministry of Science and Technology, and many others. There should be a single platform for all these stakeholders to deliberate upon their issues and propose export-friendly policy interventions (Khursheed, 2024).
- There is illegal smuggling of cattle to Iran and Afghanistan, which is causing a shortage of meat in Pakistan. This shortage further causes an exponential increase

in the price of meat. Earlier, Peshawar High Court ordered a ban on the export of Halal meat to Afghanistan, but the illegal smuggling persists. The government should strive to prevent illegal smuggling and promote legitimate exports instead (Fayaz, CEO Hamza Slaughterhouse, 2024).

- There is no focus on corporate farming, and most of the farmers are small, whose focus is on dairy farming. This has caused a shortage of supplies in the market, which requires urgent interventions. The government must promote corporate farming to fill this gap (Fayaz, CEO Hamza Slaughterhouse, 2024).
- Chillers are not available at airports, which is a serious cause of concern in the summers. At times, there are delays in flights, and chilled meat products are placed in the open air, exposed to heat. Prolonged delays can spoil the meat, which not only causes losses to the exporters but also raises concerns over the quality of our products abroad (Fayaz, CEO Hamza Slaughterhouse, 2024).

Issues and Challenges

- **Unavailability of Information about Livestock:** Absence of a National Database and lack of information about the current livestock status.
- **Focus on Dairy Cattle:** Pakistan's focus is on the dairy sector, whereas meat production is considered a byproduct. Most of the animals that are slaughtered are draught or retired dairy animals. Experts are of the opinion that high-yielding livestock breeds should be introduced to farmers, and comprehensive training programs should be designed for all stakeholders involved in meat production (Habibullah, Abid, & Hussain, 2020).
- **Lack of Value-Added Products:** Pakistan mainly exports carcasses in chilled form, and there is negligible export of processed or frozen meat.
- **Outdated Slaughterhouses and Processing Facilities:** The slaughterhouses are not at par with international standards, which leads to subpar meat hygiene.

- **Limited Cold Chain and Traceability System:** Pakistan has a limited cold chain and traceability system, which raises concerns over the hygiene and quality of meat exported from Pakistan.
- **Certifications Not Aligned with International Standards:** Certifications awarded by Pakistan are not in line with internationally recognized standards, which decreases its credibility in the global market. Private businessmen who want to export meat must acquire global certifications such as FSSC 22000.
- **Limited Participation in International Trade Fairs:** The government of Pakistan has not made any concerted efforts in facilitating meat exporters at international trade fairs. Similarly, the Commercial Attachés posted abroad make little contribution in connecting meat exporters with importers in destination countries.
- **Bureaucratic and Procedural Hurdles:** Traders face many hurdles in acquiring licenses/certificates and approvals at different government forums (Fayaz, Chief Executive Officer, 2024).
- **Focus on Small-Scale Farming:** Focus is mainly on small-scale farming and not beef farming, which leads to a dearth in the production of the required number of animals.

- **Prevalence of Diseases:** Foot and Mouth Disease (FMD) narrows down our export markets significantly. Pakistan cannot export to any of the European countries due to FMD.
- **Quality and Production of Vaccine:** The quality of the vaccine produced is low both in quality and quantity, which is one of the main reasons why Pakistan has not been able to eradicate FMD.
- **Illegal Smuggling:** Livestock is smuggled illegally to Afghanistan and Iran, which causes an increase in the price of animals locally. Since the practice is unregulated, the government is not able to earn any revenue through this export. It also causes disruption in the supply line of legitimate exporters.
- **No Slaughtering on Tuesday:** Exporters must fulfill global demand without any delays in supplies. They should be exempted from the slaughtering ban on Tuesdays as this causes unnecessary delays (Fayaz, CEO, 2024).
- **Import Dependence:** Cattle feed for fattening is import-dependent, which increases the cost of Pakistan's livestock significantly in comparison to its competitors in the global market.
- **Weak Monitoring of Calves:** There is a weak mechanism for controlling and preventing the slaughtering of male calves, which causes a decrease in the overall production of livestock.
- **Commercial Attachés Not Playing Their Role:** Attachés posted on missions abroad do not play their role in linking exporters with importers abroad. Similarly, exporters are not facilitated well enough in trade expos to display their products and establish links with importing countries (Kakakhel, 2024).
- **Lack of Facilities at Airports:** Traders lament over the absence of facilities at the airports, such as chillers. At times there are delays in flights, and the meat gets spoiled, especially in summer.
- **Inadequate Research and Development**
- **Inadequate Marketing and Branding Efforts**

International Best Practices of Exporting Halat Meat

1. **Credible Halal Certification Systems:** Both Brazil and Australia have developed robust and centralized Halal certification systems with transparency and strict oversight (Ali M. A., 2020).
2. **Modern Processing Facilities:** All the leading halal meat exporters have advanced and modern processing facilities. The United States has invested heavily in state-of-the-art facilities with strict hygiene protocols and automated processes (Agriculture, 2024). India has modernized its processing plants and slaughterhouses with the latest technology for improved traceability and efficient production, which helps maintain product transparency and integrity throughout their supply chain (APEDA, 2023).
3. **Cold Chain Management and Traceability:** All major export destinations demand traceability to ensure integrity and reduce spoilage. Brazil has a reliable cold chain infrastructure to maintain product freshness and quality throughout the supply chain (ABPA, 2021). India too has implemented a strict mechanism of traceability that allows tracking of meat from farm to fork (APEDA, 2023).
4. **Diversification and Innovation:** The global halal meat market is growing at

an exponential rate and demands innovation and diversification of products. Australia innovates Halal-certified products such as ready-to-cook meals and pre-marinated meats to cater to the demands of consumers (MLA, 2023). Similarly, the United States constantly explores value-added processing and diversification of Halal meat products to respond to global consumer needs (USDA, 2023).

5. **Animal Welfare:** The United States implements regulations and programs to ensure animal welfare (Humane, 2024). This enhances consumer confidence by promoting ethical practices. Similarly, Australia adopts strict animal welfare standards throughout their production chain (MLA, 2023).
6. **Disease Control:** All the leading exporters of Halal meat have adopted best practices to control and reduce diseases and ensure healthy and safe meat production.

a. **Biosecurity Measures:** Brazil has enforced strict protocols at farms, processing facilities, and transportation hubs, including disinfection procedures, movement restrictions, and reporting of suspicious systems (MAPA, 2024).

b. Australia has nationally coordinated disease prevention and control programs in place that emphasize surveillance for exotic diseases, quarantine measures, and biosecurity awareness programs (DAFF, 2024).

c. **Vaccination Programs:** The United States has implemented a comprehensive vaccination program against major animal diseases such as bluetongue and foot-and-mouth disease, which aims for herd immunity and minimizing disease outbreaks (APHIS, 2024). India has adopted region-specific vaccination programs to address diseases such as Foot-and-Mouth Disease and Peste des Petits Ruminants, with the aim to control and eradicate diseases (DAHD, 2024).

d. **Veterinary Services and Surveillance:** Australia has a reliable network of government-funded veterinary services for disease surveillance, diagnosis, and outbreak response (DAFF, 2024). Similarly, Brazil has established an animal health surveillance system with laboratory testing, active case finding, and data analysis to detect and address disease threats on time (MAPA, 2024).

Conclusion

- Pakistan has enough halal meat production capacity but suffers from fragmented and unsystematic policies and practices.
- Animal-related diseases such as FMD are an impediment to Pakistan's entry into European markets. Without their eradication, Pakistan cannot exploit the halal market potential of developed countries.
- A centralized database and traceability system can improve the credibility of Pakistan's Halal meat products and enable it to increase its share of the global market.

Recommendations

These recommendations are based on the different analytical methods used in this paper coupled with the insights gained from interviewing different stakeholders.

Need to Do	How to Do	When	By Whom?
Value Added Products	Implement policies that incentivize investment in the sector, facilitate access to technology and finance, and promote participation in international trade fairs and exhibitions	Medium Term	• Ministry of Commerce • Ministry of Science and Technology • APMEPA • Banking Sector
Genetic improvement of livestock through Transgenics	• Establish specialised laboratories with latest equipment and skilled personnel. • Prepare a regulatory framework for transgenic to ensure biosafety and public trust. • Since heavy finances are required, it could be done through PPP mode.	Long Term	• Ministry of Science and Technology • Livestock and Dairy development department • Private investors
National FMD Control Programme	• Establish disease free zones for FMD. • Increase in the production of quality vaccines along with timely vaccination of livestock	Long Term	• Ministry of National Food Security and Research • Livestock and dairy development department. • District Administration • International collaboration like FAO
Modernise Slaughterhouses	• Invest in clean, modern facilities with proper ventilation, drainage, and waste disposal systems. • Implement Hazard Analysis and Critical Control Points (HACCP) principles to ensure food safety throughout the process. • Make it mandatory to acquire certifications like HACCP, ISO 22000, and Global Standard for Islamic Meat (GIM) to meet international food safety and Halal standards.	Medium Term	• Ministry of National Food Security and Research. • Ministry of Science and Technology. • Tehsil Municipal Administrations. • Private investors

Cold Chain Management and Traceability	• Utilize e-tags or RFID chips to track animals from birth to slaughter. • Integrate data collection systems at farm, slaughterhouse, and processing stages. • Develop a central database accessible to authorized stakeholders. • Expand cold storage facilities at farms, slaughterhouses, processing plants, and transport hubs. • Implement real-time temperature monitoring systems to track meat quality throughout the chain	Medium Term	• Ministry of National Food Security and research • Ministry of Science and Technology • Livestock and Dairy Development Department • Private Sector/Investors
Cold Chain Facilities at Airports	• Establish Cold Chain facilities at Airports to facilitate exporters and avoid spoilage.	Short Term	Civil Aviation Authority
Centralised and Transparent Certification System aligned with International Standards	• Establish a single authority for awarding licences and certificates. • The authority should align itself with International Standards	Medium Term	• Ministry of Science and Technology • Ministry of National Food security and Research

Logical Framework Matrix

Proposed Action	Responsibilities	Resources	Timeline	KPIs
National FMD Control Programme	• Ministry of National Food Security and Research • Livestock and Dairy Development Department	• Adequate quantity of quality vaccine • Diagnostic Laboratories • Effective surveillance network	Initially 5 years but must be continued till the eradication of Virus.	• 100% vaccination of Livestock • Effective Surveillance • Incremental decrease in FMD
Animal identification and traceability	• Ministry of National Food Security and Research • Livestock and Dairy Development Department	• Identification Tags • National Database • Operational Staff/HR • Legal Framework for Mandatory tagging	5 years	• Number of Cattle markets implementing the mechanism • The number of vaccination entries uploaded to the database.

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