

SBP Staff Notes

3/22

Analyzing Meat Export Potential of Pakistan

Sabina Khurram Jafri *
Syed Zulqernain Hussain **
Attaullah Abbasi***

July 2022

Disclaimer

Views expressed in this document belong to the authors only, and by no means a reflection of the views of the State Bank of Pakistan as an institution. All errors and omissions are the sole responsibility of the authors.

*: Additional Director, Economic Policy Review Department, SBP.

** : Joint Director, Research Department, SBP.

***: Assistant Director, Economic Policy Review Department, SBP.

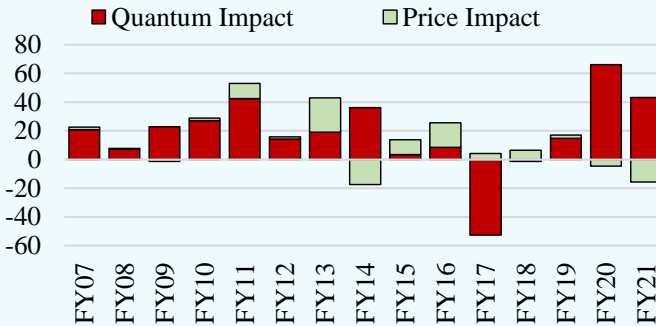
	Contents	Page No.
1	Introduction	3
2	Pakistan Meat Production and Consumption Trends	4
3	Constraints to livestock Productivity in Pakistan	6
4	Trends in Meat Exports	8
4.1	Global Meat Exports	8
4.2	Pakistan's Meat Exports	9
4.3	Composition of Pakistan's Meat Export	10
4.4	Pakistan's Major Meat Export Markets.	11
	Box 1: Meat Export from India and Brazil	12
5	Factors Impeding Pakistan's Meat Export Earnings	15
	Box 2: Factors Leading to Poor Meat Quality.	16
6	Policy Recommendations	17
7	Conclusion	19
8	Annexure I. Functions of Various Government Institutes for the Development of the Livestock Sector	21
8.1	Federal Government Departments	21
8.2	Provincial Departments	22
9	References	24

1. Introduction

This note provides assessment of Pakistan’s meat exports and identifies issues limiting the livestock sector’s growth. Pakistan’s meat export volumes have increased by a thousandfold over the last fifteen years. In contrast, the unit values of meat exports mostly remained sluggish (**Figure 1a**). The country mainly exports low-value meat products, and these exports fetch one of the lowest prices even within the low value-added segment (**Figure 1b**). According to international comparison, Pakistan’s meat yields are substantially less than the highest global and even average yields, which indicates issues in the supply chain (**Figure 1c**). The rising export quantum has added pressure to meat supply in the domestic market, pushing the increase in meat prices above the headline CPI inflation in the country in the past few years (**Figure 1d**). One of the main impediments to the advancement of the livestock industry is the unavailability of factual information about livestock production. The country’s main policy focus is on the dairy sector, whereas meat production is considered a byproduct. As indicated by market sources, if the current export and domestic consumption trends continue, the country may become a net meat importer in a few years. According to our findings, given the current supply constraints in the domestic market, unavailability of reliable statistics about livestock production, and inefficiencies in export performance, the country does not seem to hold potential for meat exports. To ensure sustained meat supplies for the domestic market and export sector, the policy efforts should focus on addressing supply chain issues.

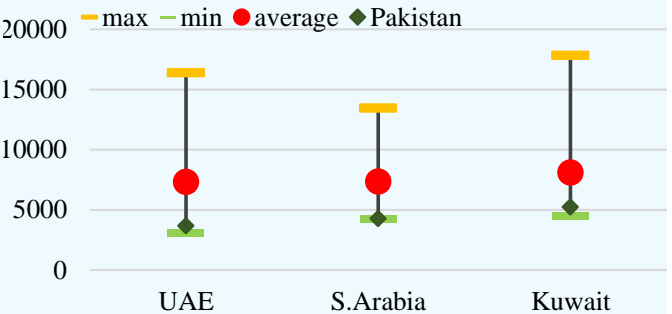
Meat exports of the country are constrained by multifaceted issues ranging from poor supply chain management, lack of policy focus on meat production, low quality of export products, lack of entrepreneurship, and absence of brand names. The meat export industry is in a fragmented state, with no overarching policy encompassing all aspects of the sector. Most of the activity such as the rearing of animals, transport, sale and slaughtering takes place in the informal sector. The absence of policy focus on meat production gives rise to numerous supply-side issues such as nutritional constraints, absence of required infrastructure and transport facilities, premature

Figure 1a: Increase in Volume Driving Meat Exports (million US\$)



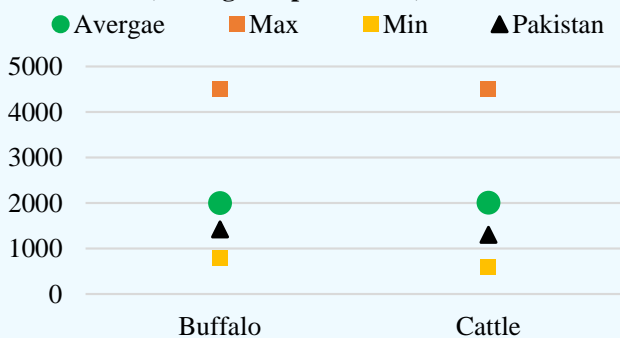
Source: SBP Staff Estimates Based on Pakistan Bureau of Statistics Data

Figure 1b: Pakistan Earns One of the lowest Unit Prices for its Major Export Category (Fresh/chilled carcasses of Bovine Animals) (US\$/ton)



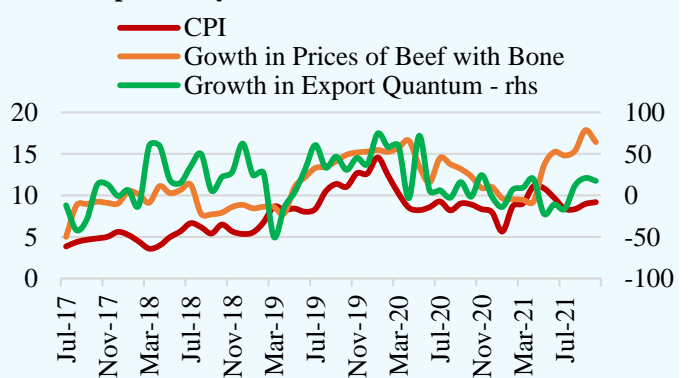
Source: International Trade Centre

Figure 1c: World Yield comparison of Livestock Meat Production (Hectogram per animal)



Source: FAO

Figure 1d: Expansion in Meat Export Quantum Accompanied by Rise in Domestic Meat Prices



Source: Pakistan Bureau of Statistics

slaughtering, lack of modern abattoirs and processing facilities, absence of beef breeds in cattle, absence of animal fattening practices, and lack of regulatory oversight required for the development of meat export industry.

After the fiscal devolution the mandates of federal and provincial government institutions vary from policy formulation to quarantine facilities, veterinary healthcare services, establishment and maintenance of infrastructure for livestock and dairy value chain, extension services and training and capacity building. However, policy implementation challenges at both federal and provincial levels arising from the dearth of the trained workforce, lack of required infrastructure, and unavailability of reliable statistics about livestock have narrowed the scope of service delivery. Inadequate extension services and below-par veterinary facilities further compound the supply side challenges because of the prevalence of various diseases and the low meat yield of animals. In addition, a majority of livestock farmers are small holders living in far-flung areas, which further constrains the outreach of government incentives.

The near absence of commercial livestock farming is an important impediment for the growth of meat exports. Developed countries require traceability of meat export products to ensure hygiene requirements and fulfillment of health standards. However, the current market dynamics do not allow tracking and tracing of animals. In addition, poor rearing practices in the informal sector lead to a low meat yield of animals. Another issue is the lack of entrepreneurship and awareness among exporters, who indulge in price cutting to get higher export volumes. Such a strategy proves detrimental to brand development and impedes the long-term growth of this sector. While Pakistan has been unable to utilize its large livestock population, its competitors like India and Brazil are enjoying a sustained increase in meat export earnings. Focused policy approaches such as incentivizing commercial livestock farming, provision of government support for livestock production and investment in marketing have enabled these countries to benefit from the world's largest population of some livestock categories.

To ensure sustained meat supplies for the domestic market as well as for the export sector, the policy efforts should focus on addressing supply chain issues, with special attention to the following: (i) conducting a fresh livestock census to provide reliable estimates of livestock production in the country; (ii) development of feed industry; (iii) strengthening livestock extension and veterinary services; (iv) establishment and maintenance of infrastructure for livestock value chain; (v) revamping marketing system to ensure fair prices; (vi) introduction of high meat-yielding breeds; (vii) policy attention on meat production by incentivizing commercial livestock farming. We suggest the development of special cattle farming zones similar to the idea of Special Economic Zones, which can provide opportunities for largescale livestock farming in Pakistan by providing all the relevant facilities and incentives to the investors settling in the zone. This development will not only ensure sustained meat supplies but will also lower the cost of production, which will also be instrumental in muting meat price increases in the domestic market and improving the competitiveness of Pakistan's exports. In addition, focusing on brand development and ensuring compliance with international meat export standards can further boost the meat export earnings of the country. In this context, the authorities may consider fixing a minimum export price for meat, which will further strengthen meat export unit prices.

The note is structured as follows: The trends of meat production and consumption in Pakistan are discussed in section 2. Section 3 identifies constraints to livestock productivity in Pakistan. Section 4 discusses Pakistan's meat export trends, gives a synopsis of world meat exports and also studies factors underpinning the success of India and Brazil as reliable meat exporters. Section 5 highlights the key factors affecting Pakistan's meat exports, while policy recommendations are presented in section 6. The last section concludes the staff note.

2. Pakistan Meat Production and Consumption Trends

Livestock has a critical link with economic growth through both direct and indirect channels. This is a direct source of food and raw material needs of the growing economy and an additional source of income for the rural population all-year round. Livestock partly shields rural incomes from the adverse impact of fluctuations in crop

Figure 2a: Share and Contribution of Livestock

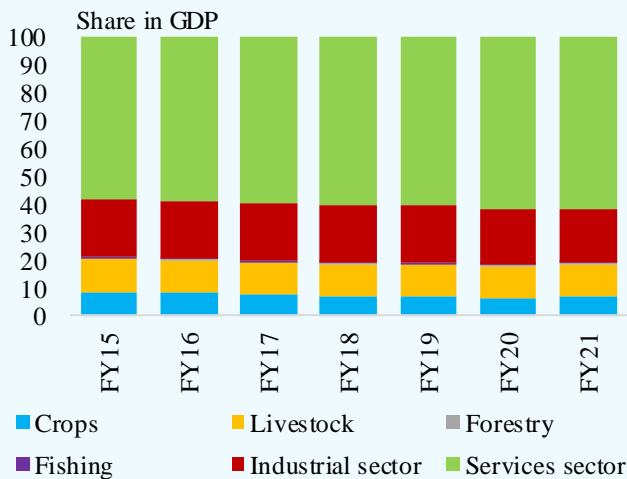
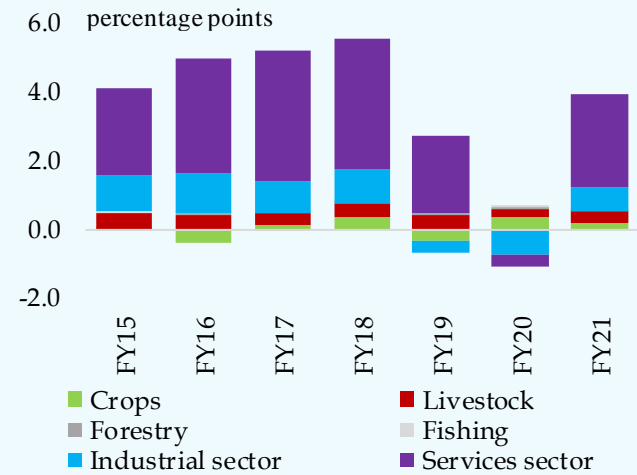


Figure 2b: Contribution in GDP growth



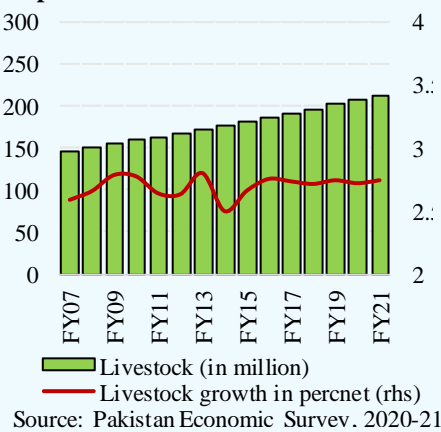
Source: Pakistan Economic Survey

production and is also a source of cash in the face of unforeseen contingencies. This sector also indirectly improves farm productivity by providing funds for upscaling crop management practices by applying required pesticides and fertilizers and procuring farm machinery. According to a World Bank estimate, an increase in livestock productivity is a precursor to improvement in per capita income in developing economies [Pica. et al. (2008)]. In Pakistan’s case also, livestock is an important sector employing around 22.0 percent of the total labor force. Livestock contributed around 14 percent of the overall economy as measured by GDP during the last five years (Figure 2a). Pakistan’s real GDP has grown on average by 3.6 percent during the last 5 years, out of which around 0.4 percentage points is contributed by the livestock sector (Figure 2b). However, the latest data on livestock production is not available for Pakistan, which makes the evaluation of the actual performance of this sector quite challenging.

The livestock data published by the Pakistan Bureau of Statistics is based on a census held in 2005-06. For the annual estimation of livestock performance, PBS applies an almost constant growth rate based on the inter-census (1996 and 2006) estimates (Figure 3a &b). An international comparison shows that Pakistan is among the top three world producers of buffalo and goat meat and is among the top ten meat producers for cattle and sheep (Figure 3c). However, as the data for Pakistan is based on the PBS estimates, the findings of this comparison should be seen with caution.

Pakistan’s per animal meat yield is substantially lower than the global highest as well as average levels. The gap in average yield is sizeable for buffalo and cattle, which is the country’s major export category. The low meat yield indicates underlying weaknesses in the meat supply chain. Specifically, poor rearing practices of livestock, such as low-quality feed and absence of animal fattening practices, lead to low production of meat per

Figure 3a: Livestock Population



Source: Pakistan Economic Survey, 2020-21

Figure 3b: Livestock Population Growth

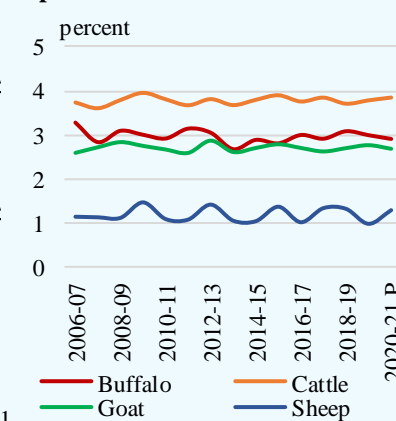
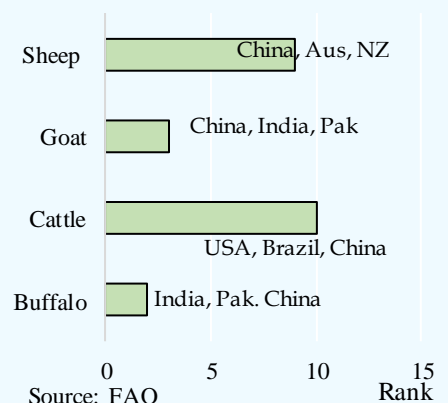
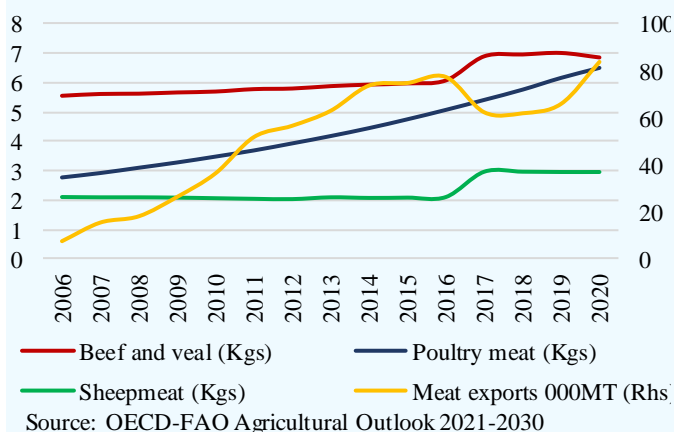
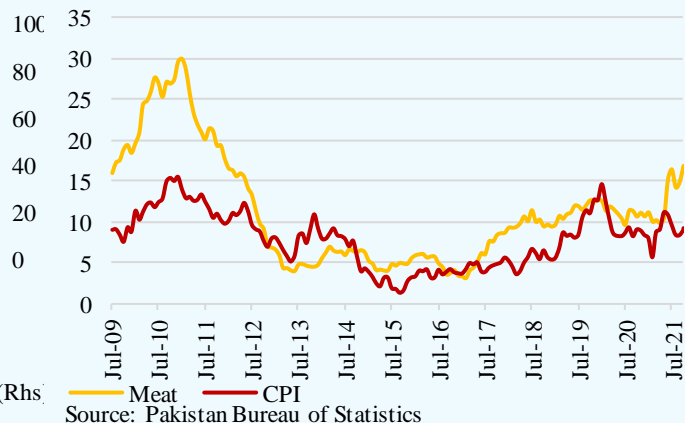


Figure 3c: Pakistan's Rank in Meat Production and Top 3 Producers



Source: FAO

Figure 4a: Meat - Per Capita Consumption and Export Quantum in Pakistan**Figure 4b: Trends in Inflation**

head. On the other hand, rising income levels, a shift in consumer preferences, mushroom growth in eateries, and improvement in the meat supply network with the opening up of more retailing outlets have shored up meat consumption in Pakistan (**Figure 4a**). In addition to domestic consumption, meat export volumes have also gone up by a thousandfold over a period of last fifteen years. However, the increase in demand is not accompanied by a corresponding increase in supply, leading to a sharp increase in meat prices in the domestic market (**Figure 4b**).

The meat supply chain pressures are evident from the upsurge in domestic prices of meat. The meat price inflation has generally remained above the headline CPI inflation in the country. The long-term viability of meat exports is contingent upon addressing the livestock supply chain issues by improving extension services, encouraging livestock farming in the private sector, and strengthening monitoring of various government regulations, as discussed in the following section.

3. Constraints to livestock Productivity in Pakistan

A number of factors have impeded the growth of the livestock sector in Pakistan. These include lack of policy attention on meat production, poor extension services, inadequate availability of nutrient-rich feed, widespread animal diseases, poor management practices, and lack of value chain, as discussed in the following.

- **Suboptimal availability of livestock feed**

The meat supply chain starts with the availability of feed and extension services for livestock. Feeding resources are one of the major determinants of animal productivity. Livestock feed includes crop roughages as well as concentrates such as cotton seed cake and maize oil cake. The issue of nutritional constraints has been pointed out by multiple research papers [Iqbal 1994; Iqbal and Ahmad 1999; Chaudhry et al. 1999]. There exists a gap between feed demand and supply [Devendra, C., & C.C Sevilla. (2002) & Devendra, C., and Leng, R.A. (2011)]. Most of the livestock feed markets are still in their infancy, and given the lack of a perfect competitive structure, the firms are not incentivized to improve the quality of feed. The livestock extension system is not efficient in disseminating information about technologies to introduce improvements in feed availability. Habib et al. (2016) estimated the demand-supply gap for livestock feed in Pakistan and found that the domestic supply was not sufficient to meet livestock feed requirements. Specifically, the supply gap for dry fodder, protein and metabolizable energy was 19.4 percent, 37.2 percent and 38 percent. Tariq (2020) highlighted that availability of fodder is seriously impacted during extreme winters (December and January) and summers (June and July). This situation can be addressed by innovative interventions such as the formation of silage.

- **Lackluster extension services**

Extension services create awareness about efficient agriculture practices through knowledge transfer, which helps in improving the productivity of the agriculture sector and shores up rural incomes on a sustainable basis [Zwane (2012)]. Various studies found a significant impact of extension services on farmers' awareness and animal productivity [Wyne et al. (2017); Warriach et al. (2018)]. The agriculture departments in developing countries

mostly focus on providing extension services on crop management practices, while the assistance to the livestock sector is mostly limited to veterinary services [FAO; ODI(1996)]. The productivity of livestock can be improved by providing effective extension services creating awareness about suitable feed, efficient rearing practices, and the impact of various environmental stresses on animal meat quality.

- **Meat production lacked policy attention in Pakistan.**

The policy focus in Pakistan largely remained on dairy production, while the production of meat was considered a byproduct [Shoab et al. (2017)]. Generally, animals are not nurtured for meat production, and a lack of animal husbandry services leads to lower livestock production in Pakistan [Iqbal and Ahmed (1999); Bashir et al. (2015)]. Male calves are generally fed on crop residues and are not provided a nutrient-rich diet. Concentrates and other better-quality nutrients are provided to females to increase dairy production. Male calves are slaughtered at a young age, which leads to poor beef quality and low meat yield per animal [Beef Cluster Feasibility and Transformation Study, 2020].

Beef production is not a primary product because, traditionally, species are raised to produce milk. The meat generally comes from old age animals with decreased milk production capacity or an emergency slaughter because of injury or disease. Commercial farmers favor raising male calves and goats as compared to rural and small farms for selling on sacrificial occasions. The meat production cost and as well as returns are high in commercial farms as compared to the other two production systems.

- **Animal diseases undermine the growth potential of the livestock sector.**

Livestock farmers are confronted with the problem of various animal diseases, which have a profound impact on the meat supply chain. [Iqbal (1994); Iqbal and Ahmad (1999)]. The widespread incidence of animal diseases is one of the main factors inhibiting the development of livestock and productivity in Pakistan. Foot-and-Mouth Disease (FMD), Mastitis, ticks, hemorrhagic septicemia, and blackleg are some of the most important bovine health issues. These diseases lead to lower milk production and restrict animal growth, thus causing lower meat production and, if not properly treated, cause high mortality in cattle and buffalos. Extension services are generally poor; farmers have limited knowledge about modes of transmission of these diseases and prevention methods [Ghaffar et al. (2020)]. Animal diseases have a profound impact on livestock productivity and rural incomes. The incidence of these diseases can be controlled by proper vaccination of ruminants, effective extension services and training. The farmers mostly rely on traditional methods rather than approaching required veterinary extension services. This leads to a high mortality rate as well as loss of income for the farmers. [Ashfaq (2014); Marton Upton (PPLPI)]. In addition, many countries are reluctant to import from those markets where diseases such as foot and mouth diseases are frequent.

- **Absence of a fair price mechanism**

The absence of a fair price mechanism appears to be a constraining factor for the profitability of the livestock farmers, which eventually leads to lower investment in this sector. [Chaudhry et al. (1999); Pakistan Business Council (2021)]. Although the meat prices are fixed by the government, prices of inputs such as feed are not regulated. From the perspective of the government, the objective of price control is to ease inflationary pressures and discourage arbitrary pricing. However, such interventions often result in market distortions. Price capping disincentives value addition and production of higher quality meat.

- **Poor infrastructure and transportation system**

Infrastructure and transportation are also an issue impeding the performance of the livestock sector [Chaudhry et al. (1999)]. Varying from value chain infrastructure to roads and market infrastructures, there is ample room for improvement. Sohaib and Jamil [2017] argued that there is a need to adopt innovative technologies for the breeding of animals, animal welfare and feeding system. Additionally, mechanized abattoirs and improved packaging facilities can enhance the quality of meat. There is unavailability of meat processing units in rural areas through which meat could be processed for high-end markets. The livestock farmers take ruminants to the marketplace (*mandis*) using the same modes of transportation used for transporting goods. The marketplace does not contain proper facilities for animal feeding and care. Poor infrastructure leads to problems such as stress and

dehydration for animals which eventually is translated in low-quality of meat.

- **Animal rearing is mostly an informal activity**

Livestock farming is mainly concentrated in the informal sector, where small farmers raise few animals in their homes. These farmers mostly rely on the traditional system, where animals are fed on crop roughages Pakistan Business Council (2021). This is in contrast to the commercial farming methods that undertake animal fattening practices to increase meat yield. In addition, farmers have limited access and awareness of institutional and financial services available to them. The absence of commercial farming gives rise to the issue of animal traceability, as it is not possible to track and trace animals raised at informal places. The low involvement of the formal sector in the meat supply chain has tainted the growth prospects of the livestock sector.

- **Coordination failure**

Coordination failure among different stakeholders is also a big issue [Abedullah (2021)]. At its core, the lack of a suitable and efficient institutional framework does not bode well in attracting investment in this sector. There is a lack of collaboration among various institutions. For instance, local governments are looking at slaughtering control, the agriculture department is working on fodder production, forestry department for range land development, industries department for meat and dairy industries, Punjab Food Authority for quality control, labs, testing and certification bodies, federal government institutions like Export Development Fund, Trade Development Authority of Pakistan, Commerce Division for trade and export promotion and State Bank of Pakistan for credit policy. Coordination amongst the provinces for the growth of livestock sector is also missing. In addition, there is lack of coordination and partnership with the private sector, which is imperative to produce the high-value livestock products.

- **Policy implementation challenges at the federal and provincial level**

Before the 18th Constitutional Amendment, the Ministry of Livestock & Dairy Development was mainly responsible for overseeing the livestock sector. After the fiscal devolution was announced in 2010, the functions of the ministry were partly devolved to provincial governments in 2011. The responsibilities and mandates of federal and provincial government institutions vary from policy formulation to quarantine facilities, veterinary healthcare services, establishment and maintenance of infrastructure for livestock and dairy value chain, extension services and training and capacity building. Despite the presence of the required regulatory framework (**Annexure I**), the livestock sector has shown lackluster performance, as seen by stagnant export unit values and a sharp increase in domestic prices of meat. Policy implementation challenges at both federal and provincial levels, lack of financial resources, dearth of a trained workforce, and unavailability of reliable statistics about livestock are some important impediments to the development of the livestock sector. In addition, a majority of livestock farmers are smallholders living in far-flung areas, which constrains service delivery.

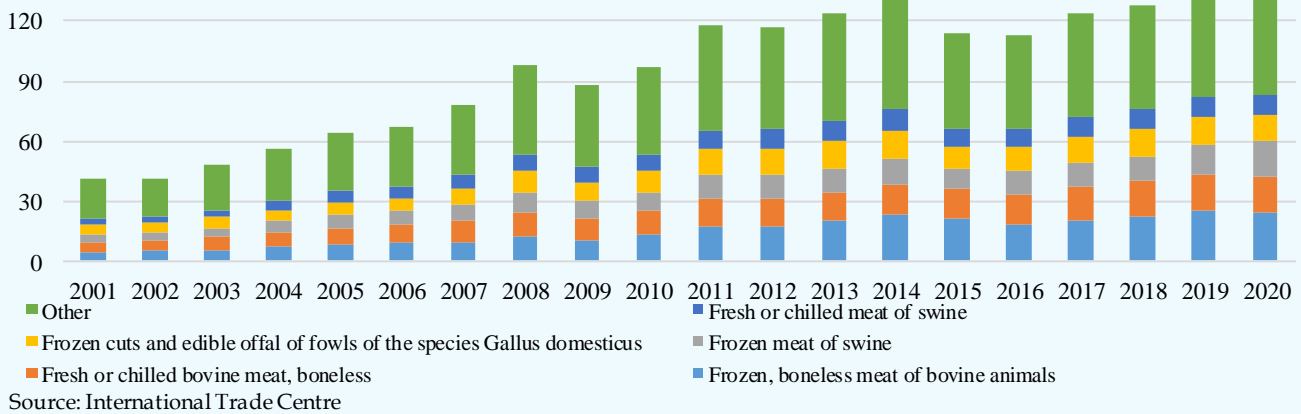
4. Trends in Meat Exports

4.1 Global Meat Exports

Global meat exports increased from US\$ 68 billion in 2006 to US\$ 127 billion in 2020, with a compound annual growth rate (CAGR) of 4.7 percent. This is in line with growing global meat consumption due to an increase in population and per capita consumption, which in turn is because of increasing income levels [Whitnall and Pitts, 2019] and [Whitton, 2021]. Of the 74 products traded in the meat and edible offal category, frozen boneless meat of bovine animals and fresh or chilled boneless meat of bovine animals account for 31 percent of total meat exports (**Figure 5**).¹ Furthermore, it is worth noting that the category of frozen boneless meat of bovine animals depicted a CAGR of 7.1 percent in 2006 and 2020, outpacing the overall compound growth in meat exports. This has increased the share of frozen boneless bovine meat in the total global meat exports, from 13.2 percent in 2006 to 18.4 percent in 2020. The growth in the category is driven by increased demand for the product globally,

¹ The calculations are based on the average for 2016-20 period. (Source: International Trade Centre)

Figure 5: Global Meat Exports



specifically from China. China’s imports of frozen boneless meat of bovine animals rose to 1.8 million tons in 2020, from 0.0009 million tons in 2006.

In the meat importing countries, China took over Japan as the major importer of meat in 2018. In 2020, China alone accounted for 22.3 percent of all meat imports. This is because China’s beef demand has outpaced slower growth in the domestic production of beef [ADHB 2020]. Other than China and Japan, the USA, Germany and Hong Kong are major importing markets (**Figure 6a**). The primary meat exporters are the US, Brazil, Australia, Netherlands, Germany and Spain (**Figure 6b**). Collectively, in terms of value, they account for more than 50 percent of global meat exports.

Figure 6a: Top 10 Exporters of Meat (2016-20)

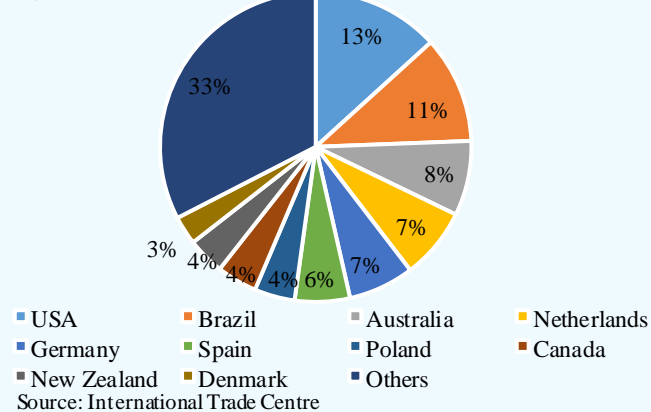
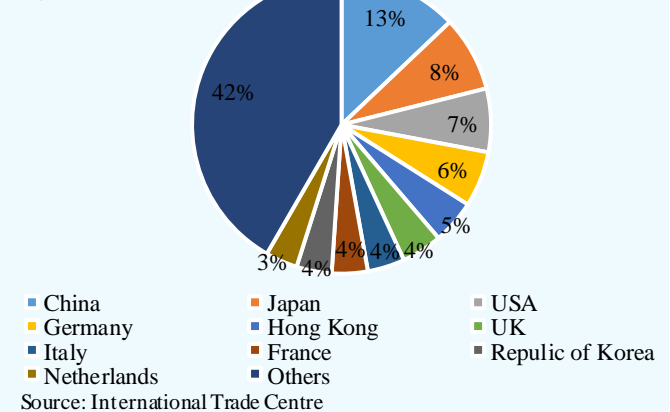


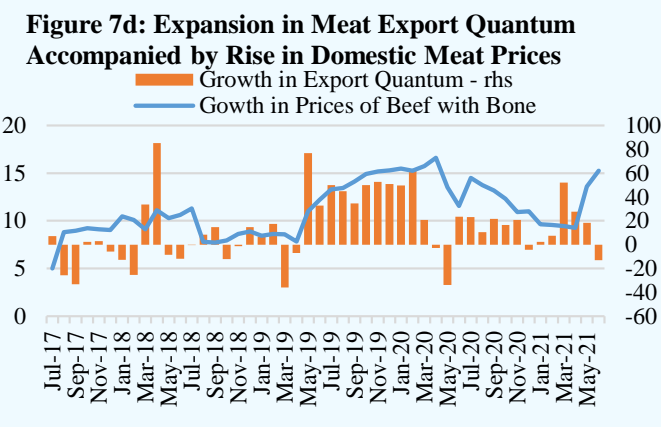
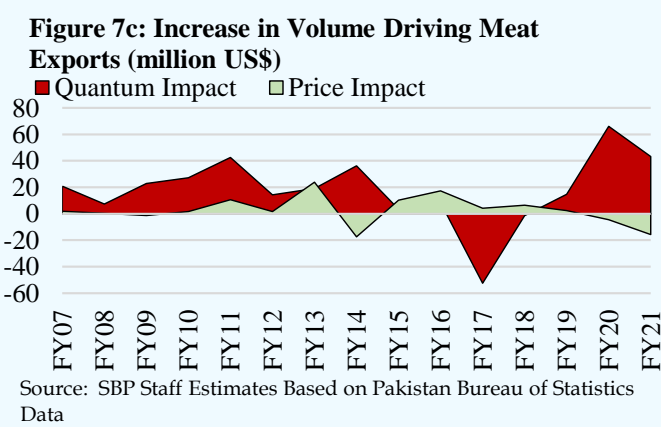
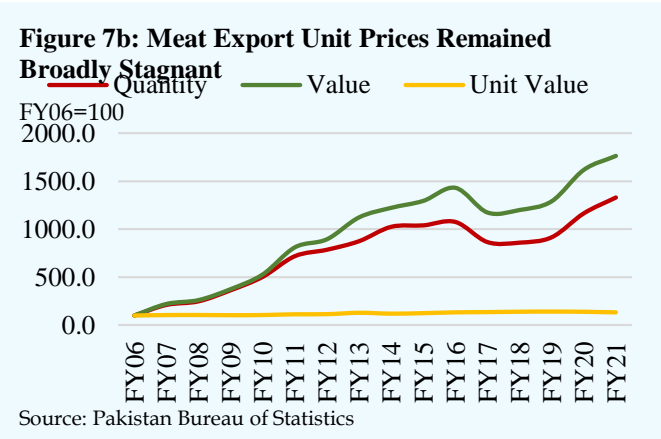
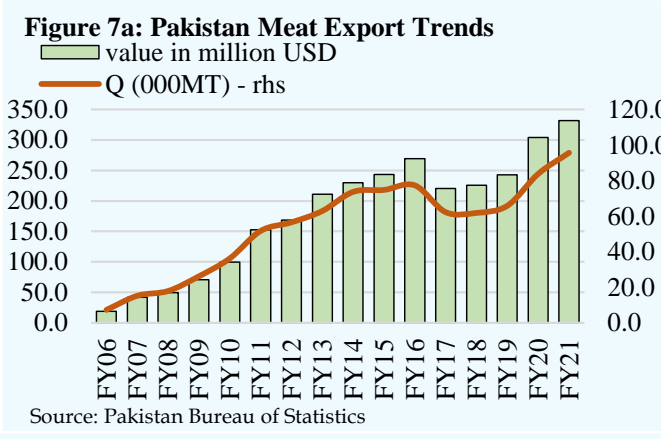
Figure 6b: Top 10 Importers of Meat (2016-20)



4.2 Pakistan’s Meat Exports

Pakistan’s meat exports have been on a steady uptrend for the past two decades, rising from a mere US\$ 18.8 million in FY06 to US\$ 331.6 million in FY21 (**Figure 7a**). An anatomy of this gain indicates that around 85 percent of this increase was underpinned by growing export volumes, whereas unit prices remained mostly sluggish. Specifically, over a period of the last fifteen years, the export volumes have gone up by a thousandfold, whereas unit prices have seen a mere 32.6 percent increase (**Figure 7b**), which was mainly concentrated in the last decade (FY11-FY19).

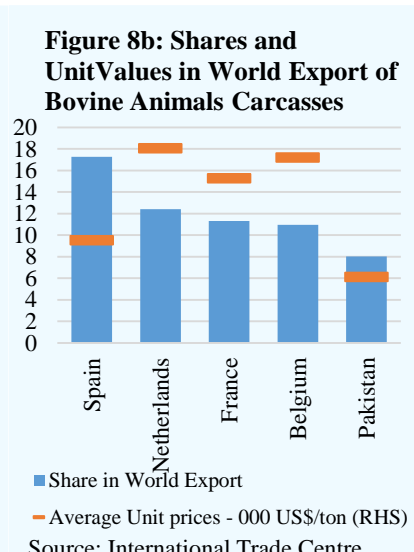
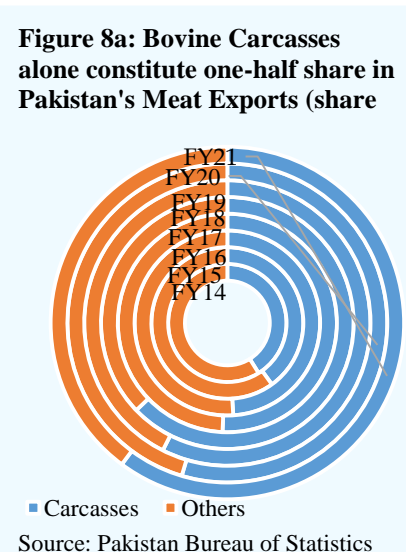
The expansion in export quantum hints at healthy demand for the country’s meat sector. However, as is the case with other major exports of the country, meat exporters are unable to introduce value-addition in products, which has led to the slackening trend of export unit prices. Moreover, the country mainly exports low-value meat products, and these exports fetch one of the lowest prices even within the low value-added category. This slack mainly stems from quality concerns about Pakistan’s meat exports arising from various supply chain issues. Another issue is the lack of entrepreneurship and awareness among exporters, who indulge in price cutting to get

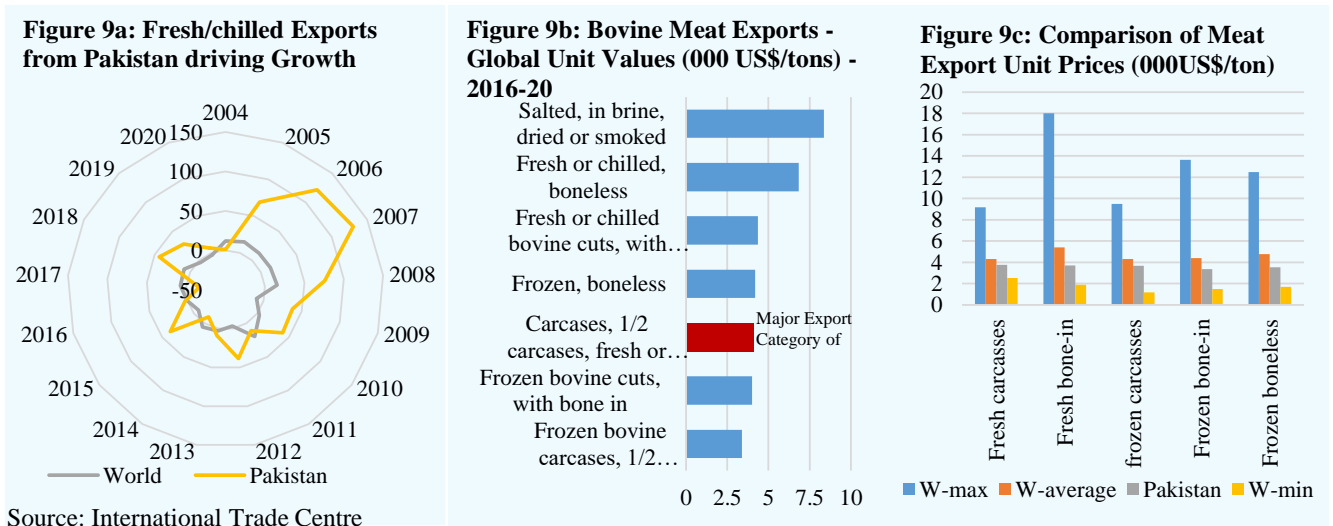


higher export volumes. Pakistan’s major markets are UAE, Saudi Arabia and Kuwait; however, given the narrow product mix, the country occupies a meager share in the overall meat import market of these countries.

4.3 Composition of Pakistan’s Meat Export

Over one-half of Pakistan’s meat exports are concentrated in the category of Fresh/chilled carcasses of bovine animals (**Figure 8a**). Pakistan is the fifth largest exporter in this segment, occupying an 8.1 percent share in its global exports during 2016–2020 (**Figure 8 b**), followed by Spain, Netherlands, France and Belgium. However, export products from Pakistan earn lower unit values than these competitors in this category. Fresh and frozen bovine cuts are some other important meat exports of the country.





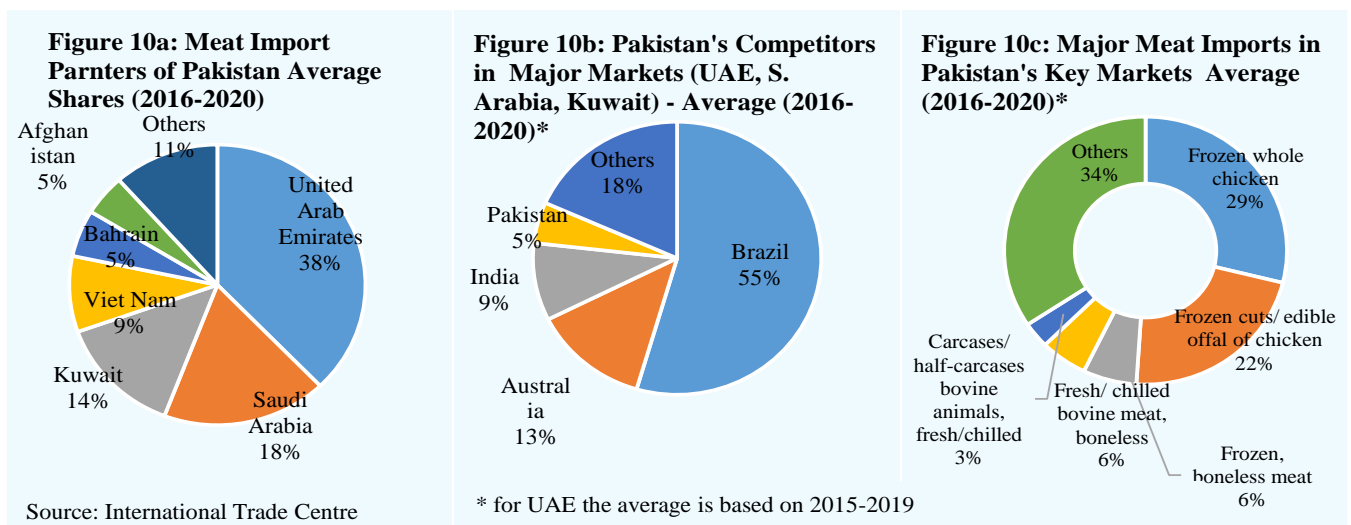
Pakistan’s meat exports have been growing at a rapid pace for the past many years, outpacing the expansion in the world’s overall meat exports (Figure 8c). This surge stems from the segment of fresh/chilled meat exports (Figure 9a). However, their share in overall world meat exports remains marginal.

A comparison of the unit prices of the world’s major meat export categories shows that salted and smoked meat fetches the highest prices, followed by fresh/chilled or frozen boneless as well as bovine cuts of meat. Meanwhile, fresh/chilled carcasses & half carcasses, which constitute a large share of Pakistan’s meat exports, carry much lower rates than these categories (Figure 9b). Hence, the unit prices earned by Pakistan’s products are generally lower than the world averages. Our competitors are able to get good prices because of better quality and a diversified export base.

Pakistan’s export earnings are crimped by quality concerns arising from various supply chain issues. Even within the segment of fresh/chilled carcasses & half carcasses, the average export unit prices earned by Pakistan are lower than world competitors (Figure 9c).

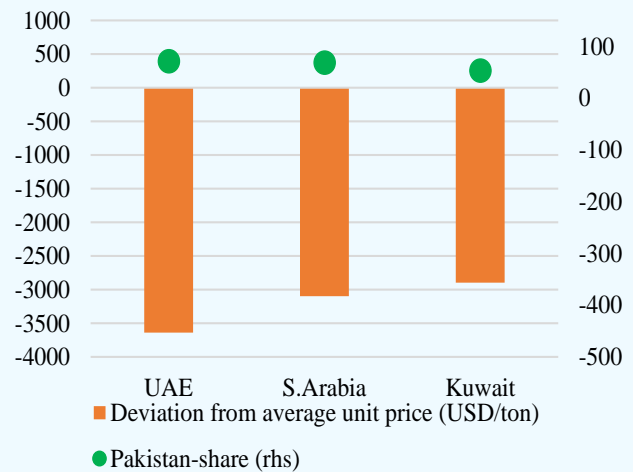
4.4 Pakistan’s Major Meat Export Markets.

Pakistan’s major markets are UAE, Saudi Arabia and Kuwait, with around 70 percent share in exports (Figure 10a). The country is not one of the major meat suppliers in these markets, which in turn, have a huge reliance on Brazil, Australia and India for meeting import demand (Figure 10b). One reason could be a narrow product mix offered by Pakistan. Meat imports of these countries are largely dominated by poultry products, whereas fresh/chilled bovine carcasses, which is Pakistan’s major export product, carry only 3.1 percent weight in overall meat import of these countries (Figure 10c).



Even though Pakistan is a large supplier of fresh/chilled bovine carcasses to these markets, the unit prices of its product are one of the lowest among competitors in this segment. As shown in **Figure 11**, Pakistan’s export for this category capture around 70 percent share in the UAE market; however, the unit prices of Pakistan’s products are US\$ 3.6 thousand/ton lower than the average price in this market. The same is true for other major markets of Saudi Arabia and Kuwait. On the other hand, Australia, Brazil and India earn much higher prices for the same products (**Box 1**). This slack mainly stems from quality concerns about Pakistan’s meat exports arising from various supply chain issues. Pakistan’s meat exports lack the required certifications, infrastructure, and processing facilities and get one of the lowest prices. Another issue is the lack of entrepreneurship and awareness among exporters, who indulge in price cutting to get higher export volumes, as discussed in the following section.

Figure 11: Pakistan Export Performance for Fresh/chilled carcasses of Bovine Animals

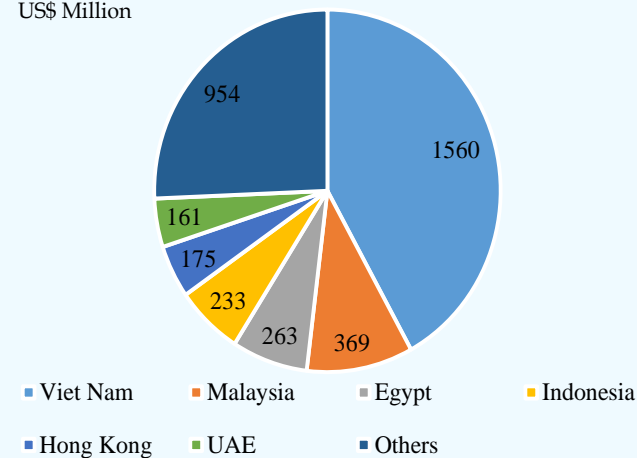


Box 1: Meat Exports from India and Brazil

India: India, the largest producer of livestock in the world, has started to impact livestock exports. The country’s meat exports showed a growth of 348 percent between 2006 and 2020 [Sonvale et al., (2020)]. This resulted in an increase in India’s global meat export share, making it the 15th largest exporter in 2020. India’s major export destinations are Viet Nam, Malaysia, and Egypt and its primary products are frozen boneless meat of bovine and frozen edible bovine offal. (**Figure 12a and 12b**).

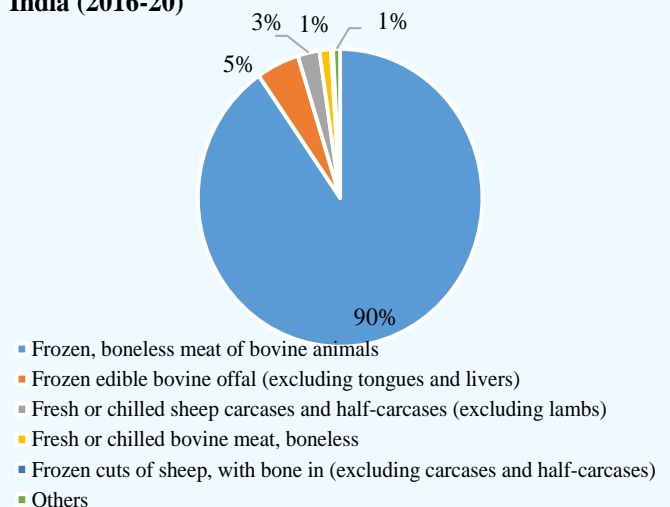
The increase in India’s exports could be due to its surplus livestock reserves. The country has relatively low per capita consumption of meat despite a high level of livestock population. Meat consumption has grown from past levels, but in comparison to other countries, it remains low [Natrajan and Jacob, 2018]. For instance, between 1978 and 2013, India’s per capita meat consumption increased from 3.6 kgs to 3.69 kg, a minor change. In contrast, China’s per capita consumption in the same period increased by more than six-fold, from 10.32 Kgs to 61.05 kgs [Jakobsen and Hansen, 2020].

Figure 12a: Major Meat Export Markets of India (2016-2020)
US\$ Million



Source: International Trade Centre

Figure 12b: Major Export Categories of India (2016-20)



In addition to low domestic demand and the largest stock of livestock, India also enjoys a comparative advantage, especially in the bovine meat exports. Production of bovine meat in India is relatively cheaper in comparison to other major exporters in the category like Brazil and Australia [Das and Das, 2017]. The introduction of the trade liberalization policy in 1991, which removed restrictions on trade and indirectly contributed to an increase in overall exports [Singh, 2017], has also had a positive impact on the country's meat exports [Kumar, 2010].

Another factor that has affected meat exports in India is the commercialization of livestock farming. Even though farming in some Indian states is still based on a livelihood and subsistence model, other meat-producing regions such as Punjab, Haryana, Gujrat, and Tamil Nadu, have moved towards a commercialized and market competitive model with a higher level of yields [World Bank, 2011].

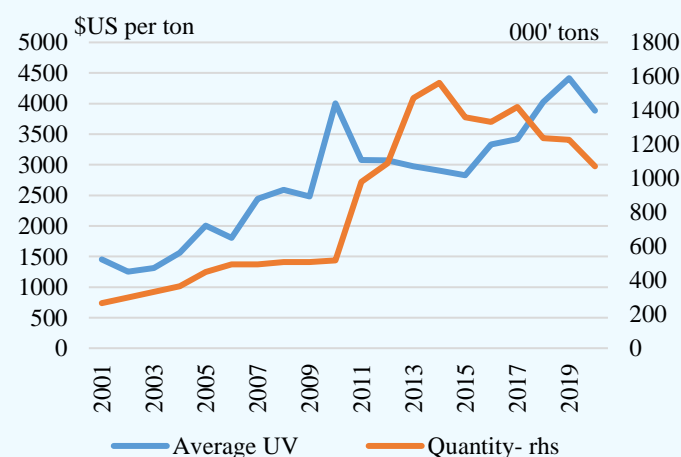
The Indian government has also taken multiple initiatives to ensure development of the domestic livestock industry and exports. For instance, the minimum price on exports of meat was discontinued in 1993, boosting the meat exports from buffalo. In addition, the Agricultural and Processed Food Products Export Development Authority, formed to promote exports, provides subsidies for the transport of agricultural products exports, which includes meat as well. The government also reduced import duties on processing machinery.

The government has also taken steps to improve the domestic livestock industry. For instance, under the Animal Husbandry Infrastructure Development Fund, a farmer in India can avail of a special credit to enhance their husbandry infrastructure. Also, the government has envisioned a cold storage scheme under PM Kisan Sampada Yojana to ensure the preservation of the products by providing an integrated cold storage facility and has also introduced Foot and Mouth Disease Control Program (FMD-CP) to curtail the disease in the animals.

Indian meat exports have also benefited from the increasing demand for relatively low-cost livestock products in developing countries. As the United States and other developed countries target high-income consumers, India has exploited this gap by using its stocks of water buffalo; the country has the highest number of water buffaloes globally. Also, in response to this demand, the country's private sector emerged in the meat processing industry with a focus on exports. In contrast to small processing and marketing facilities for meeting domestic consumption needs, export-centric processing and slaughtering facilities are relatively large-scale and modern in the country [Landes et al., 2016].

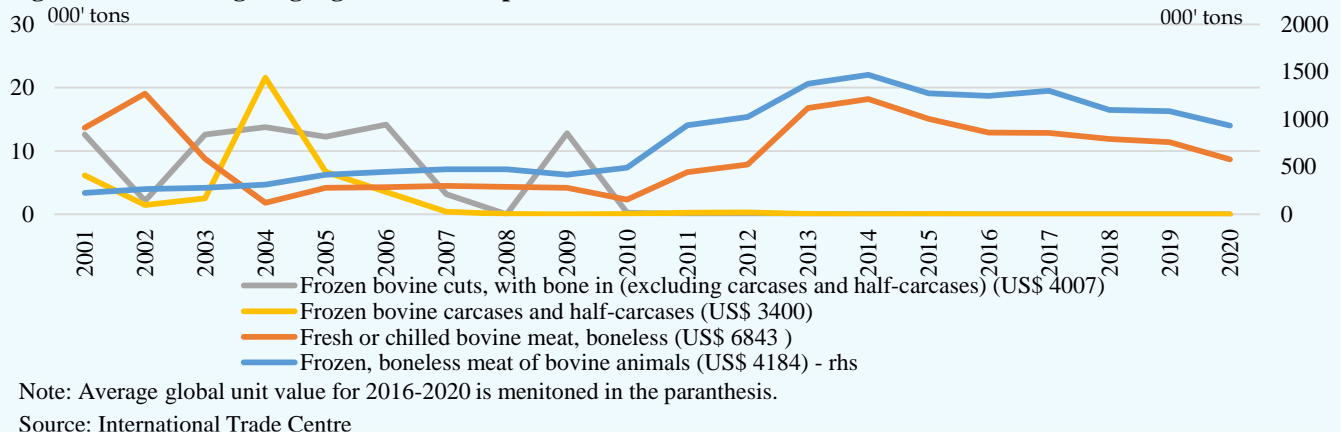
It is also worth noting that India achieved a higher export value by not only increasing the quantity but also the unit value of its meat exports (**Figure 13**). This is because India diversified its bovine meat exports in favor of the products that fetch higher unit value (**Figure 14**). In addition, the country also increased the exports of fresh sheep carcass, which is one of the highest valued meat products in the entire meat exports category. However, the share of sheep meat is still small, and the country's exports are dominated by frozen boneless meat of bovine animals. India is the third largest exporter within this subcategory, followed by Brazil and Australia.

Figure 13: Growing Unit Value for India



Source: International Trade Centre

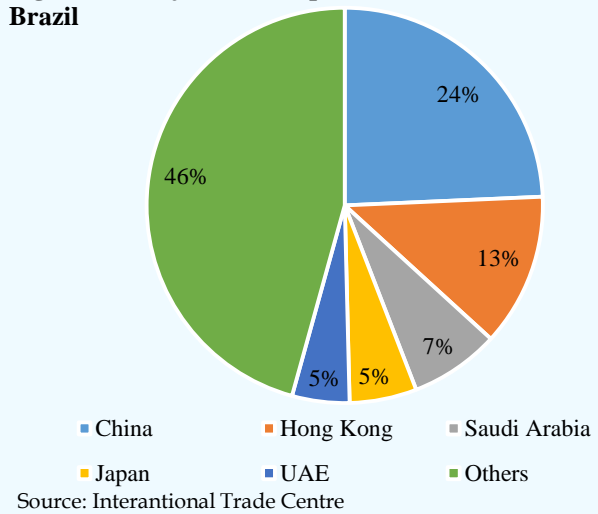
Figure 14: India targeting high value meat products



Brazil: In the overall meat and edible meat offal category, Brazil is the second-largest exporter, with exports of US\$18.23 billion in 2021. It is the major exporter of the frozen meat of bovine animals and is also one of the main competitors of Pakistan in meat exports. Pakistan’s major meat export destinations are UAE, Saudi Arabia and Kuwait, and Brazil is the primary supplier of the meat in all three markets. Along with the Middle East, China, Hong Kong and Japan are Brazil’s major export destinations (**Figure 15**).

The country’s meat exports have improved from US\$ 7.3 billion in 2006 to US\$ 15.8 billion, with a CAGR of 5.3 percent. The main driver behind the growth is frozen boneless meat of bovine animals, which, in 2020, accounted for 42 percent of total meat exports for Brazil (**Figure 16**).

Figure 15: Major Meat Export Markets of Brazil

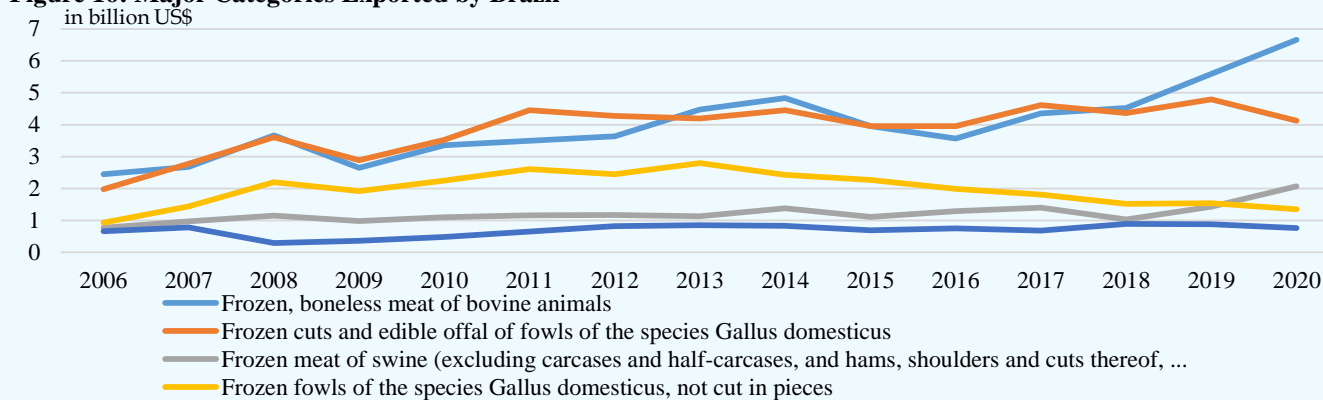


One of the reasons Brazil dominates the market is its large cattle stock. In addition, the country has also started to increase productivity by improving genetics and increasing the cattle population under intensive farming techniques like feedlot [Greenwood, 2021].²

Brazil has also invested in marketing its meat products. In 2001, Brazil’s Agency for Promoting Exports and Investments (Apex-Brazil), in partnership with the Brazilian Beef Exporters Association (ABIEC), began the Brazilian Beef project. The project’s aim is to improve the image of Brazilian beef in the world [ABIEC, 2021].

The country has also progressively worked towards eradicating foot and mouth disease (FMD), which affects milk production, fertility and is considered mortal for calves [Knight-Jones and Rushton (2013)]. As a result of a coordinated vaccination program, the country was awarded “FMD free with vaccination status” in 2018 by World Organization for Animal Health (OIE) [Menezes et al., 2020].

² Under the feedlot, the animals are kept in confined quarters, which results in quick fattening.

Figure 16: Major Categories Exported by Brazil

As discussed earlier, developed countries require traceability certification and assurance before permitting meat imports in their countries. To ensure compliance with such certification, Brazilian Agriculture and Livestock Confederation (CNA) in collaboration with ABIEC, pioneered Agriculture Traceability System. When an importer demands that the meat quality fulfills specific standards, CNA communicates the importer's needs with farmers and ensures its implementation by monitoring the farms and slaughterhouses.

5. Factors Impeding Pakistan's Meat Export Earnings

The discussions with Pakistan's major meat exporters suggest that a weak supply chain, near absence of commercial farming, lack of coordinated policy focus, logistic issues and lack of entrepreneurial skills in exporters are some of the key factors constraining the growth potential of the sector, as discussed in the following.

- Diminishing supply of livestock:** The supply of livestock (live animals) is the major issue. The livestock production estimates shared by livestock are based on a dated census held in 2005-6 and do not show the latest trends in production. Because of the sustained increase in exports and domestic consumption, the supply situation is likely to get worse in the coming years, and the country may have to rely on imports to meet domestic requirements. A few of the main reasons for the supply constraints include: (i) lack of focus on meat production leading to poor nutrition of male cows; (ii) There is no check on the slaughtering of young animals. Animals are being slaughtered at a very young age due to which potential meat supply is impacted; (iii) widespread prevalence of Foot and Mouth Disease (FMD); (iv) Rampant practice of female animal slaughter is exacerbating the livestock supply issues in Pakistan; and (v) Smuggling of animals to neighboring countries also impacts the local supply of animals.
- Uncertainty in the supply of animals:** The majority of the exporters do not invest in livestock farming to avoid the cost of managing farms and rely on *mandis* or an intermediary/contractor for the supply of animals. The supply of animals in *mandis* is however, uncertain and does not always meet quality standards. The animals are mostly sourced through small farmers, who sell animals usually to cover their expenditures. Furthermore, all the transactions between the livestock farmers and the exporters take place in cash, which also creates the problem of cash flow for exporters.
- Lack of policy focus:** The policy focus is mainly directed towards the development of the dairy sector, whereas a coordinated policy thrust to encourage commercial farming of livestock for meat production, up-gradation of extension services, and other logistic issues is missing. There are some legislation and policies made at the provincial level, but a broad policy outline at the national level is lacking.
- Logistics Issues:** Improvements in the infrastructure and logistics are required to facilitate meat exporters. Poor modes of transportation and lack of proper handling distort meat quality, which weighs negatively on export earnings (**Box 2**). The meat markets and slaughterhouses lack basic facilities such as water and

electricity, and cold storage. Furthermore, the cost of operations also increases in the absence of required infrastructure such as cold storage facilities. Exporters manage their own cold storage vehicles at the airports, which leads to additional costs. Flight delays further inflate this cost. Exporters generally prefer passenger flights to transport meat because cargo flights are relatively expensive. Sometimes, exporters face the problem of their products being offloaded if the flight has excessive luggage. Similarly, logistic support at seaports also has room for improvement.

- **Brand development and marketing-related impediments:** Brand development is also an issue. While a few exporters sell their products with their own brand, many exporters sell low-value products (entire carcasses) to wholesalers, and sometimes the final product is sold under the name of other brands. Similarly, exporters indulge in price cutting to drive competitors out of the market. Such a strategy proves detrimental to brand development and impedes the long-term growth of this sector.

Box 2: Factors Leading to Poor Meat Quality.

Meat quality is determined by various factors such as the carcass maturity, firmness, meat color, texture and order. Specifically, a higher amount of intramuscular fat (marbling) is a required attribute. These characteristics affect the appearance and palatability (tenderness, juiciness – water holding and flavor) of meat [Nguyen, Don. V., et al (2021), Stewart, S.M., (2020) Karabasil et al (2019), Hartung et al (2009), Paulson (2003)]. Although these traits are determined by genetic properties, the expression of genes may be affected by various adverse environmental stresses, nutrition and poor rearing practices. Some of the important pre-slaughter stresses are poor means of transportation, heat, deprivation of food and water, fear, exposure to unsuitable environmental conditions, improper handling and mixing with unfamiliar groups [Xing, Tong., et al. (2018), Gallo, C., et al. (2018)]. All these factors lead to defects in meat quality.

The most important defects are carcass damage, body weight loss, pale and soft or dark, and dried meat [Karabasil et al. (2019)]. These issues can be addressed by providing friendly environmental conditions to livestock to preserve the quality of meat. In addition to the environmental stresses, the provision of poor quality feed also negatively affects meat texture. The quality of meat can be enhanced by feeding ruminants with protein-rich feed and grains, as grazing on low-quality forage leads to weight loss and production of low-quality meat [Mwangi, F.W. et al. (2019)]. The grading of meat is based on the quality of meat, and a better grade of meat fetches higher demand and prices in the market.

Traceability of animals is one of the biggest hurdles: Exporters are unable to tap new markets, for instance Europe, due to the issue of animal traceability. A “farm-to-fork” traceability is required for the meat exports to advance countries, containing the entire information of the animals from breeding to slaughtering. Traceability of livestock ensures complete identification of animals along the production chain such as geographical locations where animals are kept, feed lots, processing facilities and modes of transportation. The traceability of livestock not only helps in containing the impact of diseases outbreak, it also helps in meeting international standards and improves value of the export product. Importers in the U.S., Europe and China demand proper traceability of animals to ensure quality of meat products. However, as there is no mechanism in the country to provide such guarantees, exporters cannot market their products in such markets.

- **Issues associated with the Quarantine Department:** The department is responsible for providing required certification before the export of the meat. As Pakistan is a major exporter of fresh and chilled meat, which has a lower shelf life, exporters apply for certification just before dispatching the meat to ensure the freshness. However, as the department remain close on the weekends, for the shipment to be made on Monday, exporters have to gain the certification on Friday. This reduces the expiry life of the product by two days which leads to a lower price of the product. To address this, a mechanism should be formed to provide a 7-day-a-week certification facility.

- **Deferred payments lead to defaults occasionally:** Almost 90 percent of exports are made on a deferred payments basis, which leads to default sometimes. Also, as pointed out earlier, the transactions between the exporters and farmers are on cash, which creates the problem of liquidity for the exporters.

- **Below par meat processing facilities and non-tariff barriers.** A discussion with the relevant government authorities indicated exporters' reluctance to produce and export high-value products. Importers demand direct access to meat processing units of exporters. However, this access is usually denied as compliance with international standards is generally not met by the exporter. The high demand for low-value products, particularly in the Middle East, also makes exporters complacent. Lastly, some of the importing countries have imposed non-tariff barriers, such as the Saudi Food and Drug Authority's own halal certification.

6. Policy Recommendations:

The analysis of Pakistan's meat export trends and experiences of some key competitors, review of relevant literature and discussion with major exporters indicates that meat production needs immediate policy attention not only for encouraging export earnings but for sustaining the supply of animals for domestic consumption. The key areas that need policy focus include ensuring the availability of reliable information about the livestock supply situation, incentivizing commercial farming, devising policies to encourage meat yield of livestock, improving the feed industry addressing health challenges of animals, strengthening livestock extension services, and ensuring fair price mechanism.

- **Livestock census to have actual information.** There is an urgent need to conduct a livestock census to get actual information about the livestock population in the country. The current information about the production and composition of livestock does not reflect the true underlying supply position. The rising trend of meat prices indicates supply pressures and the situation may aggravate if it remain unaddressed.
- **Steps to improve domestic supply.** The declining supply of animals requires an efficient and prudent policy response. There is a need to address key factors underpinning the supply constraints.

To this end, the establishment of state-of-the-art breeding houses with facilities like artificial insemination and embryo transfer to ensure constant generational improvement in animals become imperative to boost meat exports. These breeding houses should be established in each province to facilitate the local farmers and exporters. Such breeding houses could also work as disease-free areas and healthcare facilities where the traceability of animals would also be ensured. A step further in this direction is to have special cattle farming zones similar to the idea of Special Economic Zones. Such zones can provide an opportunity for largescale farming in Pakistan by providing all the relevant facilities and incentives to the investor settling in the zone.

- **Moving towards Commercial Farming.** It is important that meat production practices may be adopted on a commercial basis to increase the net returns from meat production. Establishing facilities for the fattening of animals³ to increase meat production is also a significant remedy to fill the gap between demand and supply of meat. The government should also play a proactive role by launching a business-oriented approach to steer local livestock producers towards cooperative farming.
- **Containing incidence of diseases.** The widespread prevalence of animal diseases inflicts substantial economic losses arising from both high mortality rates as well as loss of potential export orders. Specifically, the containment of FMD and tick infestation in cattle can significantly reduce economic losses. This situation can be addressed by increasing the outreach of veterinary and extension services to improve farmers' awareness about the modes of transfer and risk factors of diseases. This entails upgrading the human and physical resource base for veterinary facilities and extension staff by imparting training, hiring qualified individuals and upgrading the physical infrastructure of veterinary hospitals, labs and centers. Also, initiating mass vaccination campaigns will also help contain the incidence of these diseases. The establishment of disease-free zones would facilitate the government to improve supply availability.
- **Ensuring track & traceability of animals through a designated government's department.** Tracking & traceability of animals is one of the pre-requisites for most of the untapped markets of the world. The export

³ Animal fattening focuses on concentrated feeding to achieve the highest possible meat.

value of Pakistan's meat products can improve many folds by diverting policy focus on the traceability of livestock. Currently, the scale of commercial livestock farming is still very low in the country. Even commercial farms have not adopted efficient data management systems for livestock.

- **Extension services.** Strengthening livestock extension services is essential to create awareness in farmers to apply efficient agriculture practices. Providing extension services on crop management practices is also imperative to enhance the productivity of the agriculture sector. Extension services would facilitate farmers to have broad knowledge about modes of transmission of animal diseases and prevention methods
- **Improving logistics.** There is ample room to improve the existing logistics. A formalized Mandi system with a proper transportation mechanism is essential for the growth of the livestock sector. The buyer should directly buy from the seller so that the commission of the middleman can be avoided. Proper arrangements such as the availability of water must be ensured by the government. A proper daily record of transactions at the Mandi shall be maintained to streamline and record the actual volume of transactions

In addition, large-scale abattoirs complying with sanitization and safety requirements are also imperative for the growth of meat sector. As most of the meat products are exported by air, the availability of chillers and refrigerators must also be ensured at airports so that the meat products do not get wasted in the case of flight delays and cancellations.

- **Creating “Brand Pakistan”.** Brand development is essential to capture new markets. The government and exporters should endeavor to improve appeal of Pakistani meat over the Brazilian or Indian meat. The role of TDAP is at the forefront. TDAP should facilitate exporters by engaging diplomatic missions abroad via road shows and expos. The exporters should join hands with international meat brands to obtain access to high-end markets.
 - **Export of high-value meat products.** As identified earlier, the supply of livestock is one of the main hurdles in the growth of the meat export industry. Reforms to improve the supply can produce results in the medium to long term. Under the circumstances, to generate more revenue from meat exports, there is a need to incentivize the export of value-added meat products. This will entail measures to improve processing facilities to obtain required certifications, ensure traceability of the animals through encouraging commercial farming, improve the storage and packaging facility, and invest in marketing.
 - **Ensuring fair prices to exporters and farmers.** Despite some advantages in certain meat categories, for instance, fresh/chill bovine meat exported to the Middle East, Pakistan fails to fetch a high unit value. The competition between local exporters to secure orders drives the prices down. To tackle the issue, a strong exporters association is required. The association can negotiate prices with the buyers collectively instead of individual exporters. There is also a need to fix a minimum export price for various categories of meat export to discourage unfair practices by exporters.
- It is also important to ensure that farmers get fair prices to promote interest in livestock farming. The involvement of an intermediary to facilitate the transaction between the exporter and small-scale farmer reduces the farmers' profits.
- **Developing Feed Industry.** The feed industry needs to be developed substantially to ensure quality animal feed at affordable prices. Feed plays a pivotal role in maintaining the health of livestock which in turn affects yields of livestock products such as dairy and meat. Enhancing the role of livestock extension services is imperative that can be helpful in convincing farmers to adopt modern husbandry practices.
 - **Training Programs for Livestock Farmers.** In order to improve overall meat yield, it is imperative to hold training and awareness sessions on modern methods of animal fattening and health management.

Lastly, training of staff about the religious and regulatory requirements of animal welfare from on-farm to slaughter is also important.

7. Conclusion

With around 60 percent share in the value addition of the agriculture sector, the livestock sector bears key importance for the agriculture economy of Pakistan. However, the unavailability of reliable estimates of livestock production in the country is a serious impediment in the way of effective policy formulation. Based on the current estimates, which incorporate a constant growth rate, Pakistan is among one of the largest meat producers (buffalos and goats). The per animal meat yield in Pakistan is substantially lower than the global average levels, specifically for the categories of buffalo and cattle, which is the country's major export category. These low meat yield levels indicate underlying weaknesses in the meat supply chain. Despite a weak supply chain, Pakistan is also an exporter of meat, where most of the increase in the country's meat exports during the last few years came from rising export volumes, whereas unit prices remained sluggish. The rising export quantum has implications for local supplies as well. Strengthening domestic meat consumption and rising export levels have led to supply pressures in the domestic market, which is evident from an upsurge in domestic prices of meat. The meat price inflation has generally remained above the headline CPI inflation in the country in the past few years.

The key supply side issues that have constrained the development of livestock sector in Pakistan include: (i) lack of policy attention on meat production, with the main policy focus on dairy sector, whereas meat production is considered a byproduct; (ii) near absence of commercial farming; (iii) nutritional constraints; (iv) absence of required infrastructure and transport facilities; (v) premature slaughtering; (vi) absence of beef breeds in cattle; (vii) absence of animal fattening practices; (viii) inadequate extension services; (ix) wide spread animal diseases; and (x) below par veterinary facilities aggravate the supply side challenges. In addition to these factors, export earnings are further crimped by a range of factors such as (i) absence of focus on high value products; (ii) lack of entrepreneurship; (iii) lack of coordinated policy focus; (iv) logistic issues; (v), absence of focus on brand development; and (vi) unavailability of a mechanism for ensuring traceability of meat export products. Amongst the issues identified, the lack of livestock farming at the commercial level is one of the main concerns. The developed international markets demand "farm to fork" certification, which is a challenge to acquire under the current conventional farming practices in the country.

In the absence of policy efforts to address these issues, the current pattern of demand may necessitate meat imports in the country to meet domestic requirements. To address these issues, the policy should focus on improving the domestic supply, starting with a fresh livestock census. Incentives for commercial livestock farming in the shape of special zones with necessary infrastructure can help attract investment in the sector. This will not only address the issue of low yield by adopting animal fattening practices for meat production, containing the incidence of disease, provision of improved logistics but will ensure tracking and traceability of meat exports, which is an essential requirement for getting inroads to high-value markets. The government has initiated various projects to improve the supply of livestock, for instance, *Save the Calf scheme*, initiated by the government of Punjab. There is a need to monitor the implementation of such schemes in true spirit. Similarly, there is also a need to ensure the availability of required resources such as trained staff, medicines, and testing equipment at the veterinary health facilities established by the provincial governments.

There is a need to strengthen livestock extension services to improve awareness of modern husbandry practices to small-scale farmers with subsidized vaccination facilities. Furthermore, policy intervention to improve logistics is essential to scale up the quality of meat. The infrastructure in *mandis* needs to be improved by ensuring the availability of basic facilities, like water and electricity. There is also a need to upgrade the means of transporting livestock to the *mandis* and processing facilities. Similarly, the establishment of large-scale processing facilities according to international requirements and cold chains will help improve the unit values of export products and will also lower the cost of production.

Also, there is a need to develop formalized *Mandi* system and omit the role of the middle man to ensure fair prices to the livestock farmers. On the other hand, the export unit value needs to be strengthened by fixing a

minimum export price to discourage exporters from price undercutting. Despite the supply constraints, in some meat exporting categories to the Middle East, Pakistani exporters can gain higher prices as the country enjoys an advantage due to its geographical location. Policy focus on brand development and marketing can help in improving the export earnings from this sector. The long-term development of this sector would entail efforts to introduce high meat-yielding breeds and the development of feed industry.

8. Annexure I. Functions of Various Government Institutes for the Development of the Livestock Sector

8.1 Federal Government Departments

8.1.1 Ministry of National Food Security and Research. After the partial devolution of the Ministry of Food, Agriculture and Livestock (MINFAL), some of its functions were transferred to provinces, whereas the remaining responsibilities were assigned to the newly created Ministry of National Food Security and Research (MNFS&R) in 2011.⁴ The federal government's livestock department is working under the umbrella of MNFS&R and is responsible for (i) quarantine services -animal quarantine departments/stations/facilities located anywhere in Pakistan are reporting to the livestock department; (ii) Health services - import and export of veterinary drugs, vaccines and animal feed additives; procurement of veterinary drugs, vaccines and animal feed additives from abroad for federal requirements and for inter-provincial supplies; and (iii) Grading of agricultural commodities other than food grains for export. Functions of some of the key livestock organizations under MNFS&R are discussed in the following.

The Animal Quarantine Department (AQD). AQD provides quarantine, inspection and certification services at seven different locations across Pakistan. AQD, Karachi, was established in 1980. Its main responsibilities are: (i) Regulating import and export of animals and animal products (meat); (ii) Providing certification services of uniform standard to meet international trade requirements; (iii) Preventing spread of diseases through inspection of the consignments at the points of entry/ exit; (iv) Ensuring the quality and safety of food of animal origin on the basis of scientific evidence(s) to ensure public health safety; (v) Function as WTO-SPS (World Trade Organization-Sanitary and Phytosanitary Measures), Enquiry Point for animal side;(vi) Compliance with terms and conditions of WTO, OIE (World Organization for Animal Health) and other trading-partners during import and export of animals and products of animal origin;(vii) Registration of slaughterhouses, animal casing, gelatin and other processing units meant for export of animal origin products; and (viii) Observation of international requirements by regular inspection according to sanitary and hygiene requirements to minimize the chances of contamination in export consignments.

Animal Sciences Division. The Animal Health Research Group focuses on studying the emerging and newly introduced animal diseases prevalent in Pakistan. The division has conducted a number of studies on Foot and Mouth Disease Virus and the Prevalence and identification of tick species infesting large ruminants. The division is also responsible for Animal Nutrition and Animal Reproduction Program.

Livestock and Dairy Development Board (LDDDB). LDDDB plans, promotes, facilitates and coordinates livestock, poultry and dairy sectors development and also promotes and facilitates marketing of livestock & livestock products. Some of its key functions are (i) Provision of efficient veterinary healthcare services; (ii) Genetic up-gradation of indigenous low-producing livestock through Artificial Insemination; and (iii) Training of farmers to achieve optimum production potential.

Pakistan Dairy Development Company (PDDC) was established in 2005 by the Small and Medium Enterprise Development Authority (SMEDA), primarily to develop the dairy sector in Pakistan. The company's primary goal is to enhance the milk yield by introducing modern farm management methods, strengthening dairy value chain and enhancing the quality and affordability of product offered to the consumer. PDDC also trains various stakeholders from the dairy and livestock sector and introduces and implements Good Agricultural Practices.

⁴ Ministry of Commerce and Textile and the Ministry of National Food Security and Research are in the process of finalizing the draft of Pakistan's Livestock Products Export Policy 2022. The draft identifies the sector as a potent solution to eradicate poverty in rural areas as it is estimated that approximately 8 million families in rural areas are involved in it. It highlights that the public sector support, except for some revolving around animal health, is not focused on feeding regimes and genetic improvement of the livestock breed.

8.1.2 Pakistan Halal Authority (PHA) was formed in 2016 under the Ministry of Science and Technology with the goal of advancing and promoting Halal products. PHA ensures the Halal Status of the products, process and services in both local market and traded products. PHA also promotes trade and commerce within and out of the country for Halal commodities. PHA also recommends mechanism for the Accreditation of Halal Certification Bodies and adoption of Halal Certification systems. This body is also responsible for developing and authorizing the use of Halal logo for Halal articles and processes; levy fees for the issue or renewal of the Halal certificate and/or authorizing the use of Halal Logo.

8.1.3 Ministry of Commerce (MoC) is responsible for formulating the Strategic Trade Policy Framework for the country. A number of policy initiatives related to meat sectors are proposed by MoC in its Strategic Trade Policy Framework 2020-25. For instance, key areas of action include (i) classify meat as agriculture produce and removing withholding tax (WHT) on the purchase of livestock (ii) effective implementation of DLTL (duty drawback on local taxes and levies) Scheme (iii) enhance Pak-China bilateral trade by expediting the resolution of SPS/quarantine issues to get permission from AQSIQ China (The General Administration of Quality Supervision, Inspection and Quarantine) (iv) introduction of uniform regulations on meat producers by various departments and (v) registration of the proposed Meat Processors Association .

Trade Development Authority of Pakistan (TDAP) established in 2006, works directly under the Ministry of Commerce. TDAP has the mandate to work on product and market development as well as product and market diversification, enhancing capacity, creating awareness and conducting research & development. Furthermore, TDAP is responsible for providing support services, coordinating with a trade mission, facilitating trade, and indulging in international marketing. TDAP is also responsible for organizing the EXPO Pakistan annually. Furthermore, TDAP implements various Trade Policy Initiatives announced by the Commerce Ministry.

8.1.4 State Bank of Pakistan (SBP). In addition to various government institutes SBP has also provided policy support to the livestock sector via the **Livestock Insurance Scheme**. SBP, in collaboration with SECP, banks, insurance companies and provincial livestock & dairy departments developed Livestock Insurance Scheme in 2014 to increase access to finance for the livestock and dairy sector. The scheme provides insurance coverage for death of livestock due to diseases and other natural calamities. Under this scheme, borrowers having maximum 10 animals are eligible. Since its inception (July 2014) till the latest data available, around 0.82 million farmers have availed this scheme. The total insured amount under this scheme till December 2020 is Rs 115 billion.

8.2 Provincial Departments

The role and mandate of provinces in the development of livestock sector has increased after the fiscal devolution. The functions and responsibilities of some of the key provincial livestock organizations are discussed in the following.

8.2.1 Livestock and Dairy Development Department, Punjab has the mandate to conduct effective monitoring of field and extension activities through digitalization which includes usage of smart applications in collaboration with Punjab Information Technology Board (PITB). The department is providing toll free helpline to address public complaints; developing human resource management information system (HRIMS) to strengthen governance; and adopting cluster approach for more efficient provision of services in a coordinated manner. This department has introduced a number of initiatives recently, including: (i) initiating a project on Genetic Improvement of Non-Descript Cattle in Punjab to boost production of dairy products especially milk in the province in 2021; (ii) upgrading Civil Veterinary Hospitals and Diagnostic Labs at Divisional level; (iii) formulation of Livestock Policy in 2021; (iv) development of gene pool for robust breed improvement; and (v) initiation of Punjab Animal Health Rules.

8.2.2 Punjab Agriculture & Meat Company (PAMCO) is a Government of the Punjab-owned research and development organization. The main objective of PAMCO is to formalize the horticulture and meat sector

through interferences at each stage of production, processing and marketing – while ensuring compliance of global quality standards.

8.2.3 Lahore Meat Processing Complex. Keeping in view the rising demand of Halal meat from international market, a modern meat processing facility was formed in 2011. The complex has the capacity of processing 500 beef and 6,000 animals per 8 hours shift. The complex is equipped with a Blood Rendering Plant, Compost Plant, Waste Water Treatment Plant and Cooling system (Chilling & Blast Freezing).

Furthermore, in order to enhance Beef Production, PAMCO has initiated two projects, namely “Save the Calf” and “Feedlot Fattening”.

a) Save the Calf Scheme

Cattle in Pakistan are generally raised to meet dairy requirements, whereas meat production is not a primary focus. Around 5-6 million male calves are slaughtered before attaining the age of one month as raising calves for meat production is not a common practice. In addition, lack of proper feed and various diseases lead to a very high calves mortality rate in Pakistan. To arrest this trend, the Government of Punjab started a program “Save the Calf” from the platform of PAMCO in 2011. Under this program, a monetary grant is provided to farmers against each saved calf, while vaccination is also provided free of cost.

b) Feedlot fattening

A host of factors contribute to the low meat yield of cattle in Pakistan. For instance, insufficient and improper nutrition, lack of veterinary services, unavailability of inputs, financial constraints and farmers’ lack of information on feedlot fattening. To address these issues, PAMCO, launched “Feedlot fattening” projects providing incentives to the farmers. These incentives include, (i) registration of Beef Fattening Farms with the condition of having a minimum of 10 and a maximum of 200 animals per farm (ii) Provision of training & technical services for the farmers (iii) Vaccination & treatment services for animals; (iv) a support of Rs. 1,500 per animal after 4 months; and (iv) ensuring Compliance & Certification.

8.2.4 Livestock & Fisheries Department, Government of Sindh focuses on advancement of livestock sector in the province. Currently, this department is working on two major projects, ‘Sustainable Livestock Development for Rural Sindh’ and ‘Livestock Tagging and Traceability Project’ launched in FY19. For Pakistan, one of the main hurdle in exporting meat to developed markets like the United States and countries in the European Union is the absence of animal tracing mechanism (Tagging, Registration of animals, proper transportation and creditable database of animal to trace the animals) in the local meat value chain. Hence the successful implementation of this project will help in tapping new markets.

8.2.5 Veterinary Research Institute (VRI), Peshawar performs its duties under the **Livestock and Dairy Development Department, K.P.** VRI is responsible for conducting research on livestock and poultry diseases. It also has the mandate for diagnosis and production of Veterinary Biologics and diagnostic agents. VRI Peshawar has an elaborate network of various local and regional centers that provides range of veterinary services such as diagnostic tests and vaccination.

8.2.6 Livestock and Dairy Development Department (LDDD), Government of Balochistan is working on the following fronts (i) conserve indigenous pure breeds (ii) evolving new breeds (iii) conducting research on nutrition requirements of livestock and the chemical composition of feed. LDDD also organized a three-day Balochistan Livestock Expo in 2019 in collaboration with the Food and Agriculture Organization (FAO) of the United Nations, the University of Balochistan (UoB) and Balochistan Board of Investment and Trade. The first ever Livestock Policy and Strategy was also introduced by this department that provided the path to increase growth in the sector.

9. References

- [1] Pica, G., Pica-Ciamara, U., and Otte J. (2008). *The Livestock Sector in the World Development Report 2008: Re-assessing the Policy Priorities*. Pro-Poor Livestock Policy Initiative (PPLPI) A Living from Livestock, Research Report No. 08-07. Rome: FAO
- [2] Pakistan at a Glance, FAO in Pakistan (www.fao.org/pakistan/our-office/pakistan-at-a-glance/en/)
- [3] Upton M. (2004). *The Role of Livestock in Economic Development and Poverty Reduction*. Pro-Poor Livestock Policy Initiative (PPLPI) Working Paper No. 10. Rome: FAO.
- [4] Devendra C., Sevilla CC., (2002). Availability and use of feed resources in crop–animal systems in Asia. *Agricultural systems*, Volume 71, Issues 1–2 Pages 59-73.
- [5] Devendra, C. & Leng, Ronald. (2011). Feed Resources for Animals in Asia: Issues, Strategies for Use, Intensification and Integration for Increased Productivity. *Asian-Australasian Journal of Animal Sciences*. 24. 10.5713/ajas.2011.r.05.
- [6] Habib, G., Khan, M., Javaid, S., and Saleem, M. (2016). Assessment of Feed Supply and Demand for Livestock in Pakistan. *Journal of Agricultural Science and Technology* .A. 6. 191-202.
- [7] Tariq, M. (2020). Opportunities for Improving Feed Use Efficiency for Sustainable Dairy Production in Pakistan. *Proceedings*. 73, no. 1:11.
- [8] Zwane, E. (2012). Does Extension have a role to play in rural development? *South African journal of Agriculture extension*. 40, 16-24.
- [9] Wyne, P., McGill, D., Aslam, N., Tufail, S., Latif, S., Ishaq, M., Batool, Z., Bush, RD., Warraich, H., and Godfrey, S. (2017). The Impact of Extension Programs to Increase the Productivity of the Small Holder Dairy farming Industry of Pakistan. *International Journal of Animal Sciences*. 1(2):1008.
- [10] Warriach, Hassan & Wynn, Peter & Ishaq, M. & Arif, Shumaila & Bhatti, Muhammad & Latif, Samiya & Kumbher, A. & Batool, Zufishan & Majeed, Sheikh & Bush, Russell & Pasha, Tekin & McGill, David. (2018). Impacts of improved extension services on awareness, knowledge, adoption rates and perceived benefits of smallholder dairy farmers in Pakistan. *Animal Production Science* 59.
- [11] FAO. (<https://www.fao.org/3/t0060e/T0060E03.htm>) and Morton, J., and Matthewman, R., (1996). Improving Livestock Production Through Extension: Information Needs, Institutions And Opportunities. *Overseas Development Institute*, Natural Resource Perspective No.12.
- [12] Beef Cluster Feasibility and Transformation Study (2020). *Cluster Development Based Agriculture Transformation Plan Vision-2025*. Islamabad: Planning Commission of Pakistan, Ministry of Planning, Development & Special Initiatives
- [13] Ghaffar, A., McGill, D., Stevenson, M.A., Badar, M., Kumbher, A., Warriach, H.M., Gasser R.B., and Jabbar, A. (2020). A Participatory investigation of Bovine Health and Production Issues in Pakistan. *Frontiers in Veterinary Sciences*. Volume 7.

- [14] Ashfaq, M., Muhammad, G., U. Haq, Shamsheer., and Razzaq., A. (2014). Effects of Livestock Diseases on dairy Production and Incomes in Districts in Faisalabad, Punjab, Pakistan. *International Food Policy Research Institute*, Working Paper No, 023.
- [15] Sohaib, M., and Jamil, F. (2017). An Insight of Meat Industry in Pakistan with Special Reference to Halal Meat: A Comprehensive Review. *Korean Journal of Food Science of Animal Resources*. 37(3). 329-341
- [16] Whitnall T and Pitts, N. (2019). *Global Trends in Meat Consumption*” ABARES Agricultural Commodities: March 2019. Canberra: Australian Bureau of Agricultural and Resource Economics and Sciences;
- [17] Whitton C., Bogueva, D., Marinova, D., Phillips, C. J. (2021). “Are We Approaching Peak Meat Consumption? Analysis of Meat Consumption from 2000 to 2019 in 35 Countries and Its Relationship to Gross Domestic Product.” *Animals (Basel)*. 11(12): 3466.
- [18] Agriculture and Horticulture Development Board (AHDB) (2020). *The Beef Market in China*. London: AHDB
- [19] Greenwood P.L. (2021). “Review: An Overview of Beef Production from Pasture and Feedlot Globally, As Demand for Beef and the Need for Sustainable Practices Increase.” *Animal*. Vol. 15, Supplement 1.
- [20] ABIEC and Apex-Brasil display the sustainability of Brazilian beef at Anuga. (2021, October 5). Brazilian Beef Exporters Association. Retrieved March 15, 2022, from <http://abiec.com.br/en/abiec-and-apex-brasil-display-the-sustainability-of-brazilian-beef-at-anuga/>
- [21] Knight-Jones, T.J.D and Rushton, J. (2013). “The economic impacts of foot and mouth disease – What are they, how big are they and where do they occur?” *Prev Vet Med*. 2013 Nov 1; 112(3-4): 161–173.
- [22] Menezes, T.C., Luna, I., and Miranda, S. H. G. (2020). “Network Analysis of Cattle Movement in Mato Grosso Do Sul (Brazil) and Implications for Foot-and-Mouth Disease.” *Front. Vet. Sci.*, Volume 7 (2020).
- [23] Sonavale, K. P., Shaikh, M.R., Kadam, M.M., and Pokharkar, V.G. (2020). “*Asian Journal of Agricultural Extension, Economics and Sociology*.” 38(1): 51-62, 2020; Article no.AJAEES.54091.
- [24] Natrajan, B. and Jacob S. (2018). “‘Provincialising’ Vegetarianism Putting Indian Food Habits in their Place.” *Economic & Political Weekly*. Vol LIII 54 no. 9.
- [25] Jakobsen, J. and Hansen, A. (2020). “Geographies of Meatification: an Emerging Asian Meat Complex.” *Globalizations*, 17:1, 93-109.
- [26] Das, V.K. and Das, B. (2017). “‘Pink Revolution’: Why the Government Should Boost the Bovine Meat Industry.” *The Wire*, published on 21 Feb, 2017.
- [27] Singh, H.V. (2017). Trade Policy Reform in India. Brookings India Working Paper No. 2. New Delhi: Brookings Institution India Center.

- [28] Kumar, A. (2010). "Exports of Livestock Products from India: Performance, Competitiveness and Determinants." *Agricultural Economics Research Review*. Vol. pp 57-67.
- [29] World Bank (2011). Demand-Led Transformation of the Livestock Sector in India Achievements, Challenges, and Opportunities. *South Asia Agriculture and Rural Development*. Washington D.C.: World Bank
- [30] National Investment Promotion and Facilitation Agency (NIPFA), India (www.investindia.gov.in/sector/food-processing/animal-husbandry)
- [31] Landes, M. and Melton, A. and Edwards S. (2016). *From Where the Buffalo Roam: India's Beef Exports*. A Report from the Economic Research Service. United States Department of Agriculture (USDA). LDPM-264-01 pp. 36. Washington D.C.: USDA
- [32] Nguyen, D. V., Nguyen, O. C., & Malau-Aduli, A. (2021). Main Regulatory Factors of Marbling Level in Beef Cattle. *Veterinary and Animal Science*, 14, 100219.
- [33] Xing, T., Gao, F., Tume, R.K., Zhou, G., and Xu, X. (2018). Stress Effects on Meat Quality: A Mechanistic Perspective. *Comprehensive Reviews in Food Science and Food Safety*. Vol. 18, Issue 2.
- [34] Felista, W., Mwangi, Charmley E., Christopher, P., Gardiner, Bunmi S., Malau-Aduli, Robert Kinobe T., Aduli E. O. Malau-Aduli (2019). Diet and Genetics Influence Beef Cattle Performance and Meat Quality Characteristics. *Foods*, 8(12): 648.
- [35] Livestock Wing – Ministry of National Food Security & Research, Retrieved 18 March, 2022, from <https://mnfsr.trancemedia.pk/livestock-wing/>
- [36] TDAP, Retrieved 18 March, 2022, from <https://tdap.gov.pk/about-tdap>.
- [37] Company Profile, PAMCO, Retrieved 18 March, 2022, from <https://pamco.gop.pk/company-profile/>