Expanding Trade Opportunities by Unleashing Pakistan's Milk Export Potential

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Abstract:

This paper underscores the vital role of Pakistan's dairy sector in its agricultural economy. Despite its immense potential, the sector faces various challenges that impede its growth. Key issues include low milk productivity, significant post-harvest losses, and limited access to modern technologies and veterinary services. A holistic strategy is proposed to overcome these challenges. This includes enhancing animal genetics through the introduction of high-yielding breeds and advanced breeding techniques, which can improve productivity. Strengthening cold chain infrastructure is critical to reduce post-harvest losses, ensuring dairy products maintain quality and safety. Moreover, promoting the production of value-added dairy products like cheese, yogurt, and butter will help diversify the sector, boosting its profitability and competitiveness. This multi-faceted approach aims to transform the dairy industry, making it a more efficient and profitable part of Pakistan's agricultural landscape.

Key words:

Milk Productivity, Dairy Sector, Pakistan, Value-added Dairy Products

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Introduction

In Pakistan, the livestock sector has emerged as the largest contributor to agriculture, accounting for approximately 62.68 percent of the agriculture value added and 14.36 percent of the national GDP during FY 2023. Livestock keeping/rearing is the most important economic activity for rural dwellers in Pakistan, with over 8 million rural families engaged in livestock production and deriving 35 to 40 percent of their income from this sector. The gross value addition of livestock has increased to Rs 5,593 billion in FY2023 from Rs 5,390 billion in FY2022, indicating a growth of 3.8 percent. Additionally, the net foreign exchange earnings of the livestock sector contribute around 2.1 percent of the total exports in the country (Pakistan Economic Survey 2022-23). Several products from livestock are part of the food basket and a source of high-quality nutrients. However, among all livestock products, milk is the major one, and in many rural areas, perhaps the only source of nutrition, especially for children.

Pakistan is the 4th largest milk-producing country in the world, producing 41 billion liters of milk annually, which is not sufficient to fulfill the domestic demand for milk. To satisfy the demand, a large quantity of milk powder is imported. The share of rural milk producers in national milk production of 41 billion liters is 80%. The remaining comes from peri-urban and urban producers. Of the total milk produced, 97% is in the informal sector (i.e., milk consumed in the villages and/or sold in the cities through milk traders called "milkmen" in unhygienic conditions). Only 3% (UHT) milk is processed and marketed through formal channels. The UHT market is growing. There are 24 milk processing companies in Pakistan. They are all operated in Punjab and Sindh provinces, and there is no milk processing company in KP. The total estimated installed processing capacity is 2.42 billion liters per annum. The expansion of processing capacity and new players (e.g., Engro) has increased competition. The purchase price of milk ranged from Rs. 140 to 200/liter depending upon the fat percentage. The average price received by farmers for their milk (cow, mix, and buffalo) ranged from Rs. 130 to 160/liter. The informal system is also purchasing at a competitive price and providing services in the form of advance payments to the farmers.

In Pakistan, the average farm size is 3.78 acres, and 5 to 6 head of mixed animals per farm. The price of animals was very high. Farmers keep 1-2 buffaloes in milk with a heifer or a young calf. The farmers grow some fodder and graze the animals on field bunds/roadsides or canal banks. Depending on the location and access, only part of the milk is sold. A larger part of the production is consumed as raw milk or converted into ghee. The average lactation yield is around 1200 liters.

By and large, the productivity per animal is low, which is attributed to poor genetic resources and management practices. The seasonal fluctuations further compound the problem, which is partly attributed to the availability of green fodder and partly to the predominance of buffalo in dairy. From mid-November to mid-February and May to early July, fodder shortage is maximum. Farmers have limited access to better varieties and cultural practices. The use of supplementary feeds is also limited. The quality of feeds is generally poor due to adulteration, and prices are very high. The livestock health services are poor. Vaccination against Lumpy Skin Disease, hemorrhagic septicemia, and foot-and-mouth disease is regularly done, but still, many farmers have limited access to vaccination programs/campaigns mainly conducted by the public sector. Mineral deficiencies are quite pronounced. Both ecto and endo parasites (ticks, mange mites, round & tape worms) are commonly observed.
Women and children play an active role in livestock production. Children help in various chores, while women carry out feeding, cleaning, and milking. Men haul fodder, and women help in chopping. These activities take 3 to 5 hours a day. Women are solely responsible for homemade milk products.

The informal marketing system for milk is characterized by the presence of several small-sized farmers, milkmen, milk processors, milk/dairy shops, vendors, or halwais operating at different stages of the milk value chain. Up to 97% of milk is marketed through the milkman, and the remaining 3% is collected by the processing plants. The milkman is the main intermediary linking milk farmers in rural areas with consumers in urban centers. The milk is handled in a crude way. A typical milkman owns a few metallic containers/cans or plastic drums. The milkman transports milk in these containers to shopkeepers or khoya makers who maintain a set of boiling pans, buckets, and earthen pots for making yogurt. The milk processors have introduced an organized system of milk collection by providing cooling tanks/chillers at the farm level (cluster) and using refrigerated carriers. The milk collected at these cooling tanks/chillers (Nestle calls them Village Milk Collection Centers) is transported to sub-centers and processing plants in refrigerated carriers. This has provided competition to the traditional milk collection system dominated by milkmen and has thus enabled rural farmers to obtain somewhat better prices.

The prices received by farmers varied from Rs. 130 to Rs. 170 per liter, while the consumer price varied from Rs. 150 to Rs. 220 per liter. The consumer price for processed milk is Rs. 240-280 per liter. The main players in the traditional value chain included farmers, milk collectors, and retailers. Their share in the consumer price has been estimated at 26%, 32%, and 42%, respectively. The share of value chain players in processed milk, i.e., farmers, mini-suppliers, processors, and retailers, has been estimated at 21%, 24%, 50%, and 5%, respectively.

There is a general concern about adulteration, both for fresh and processed milk, in the absence of appropriate regulatory measures. The semi-commercial dairy farmers who have set up their own retail outlets are much better off as they obtained higher prices. Their sale price direct to the consumer was Rs. 150-200 per liter. The other marketing agents included de-creamers and khoya makers whose margin varied from Rs. 20 to Rs. 30 per kg. Desi ghee was also being prepared at the farm level but reported has a diminishing market.

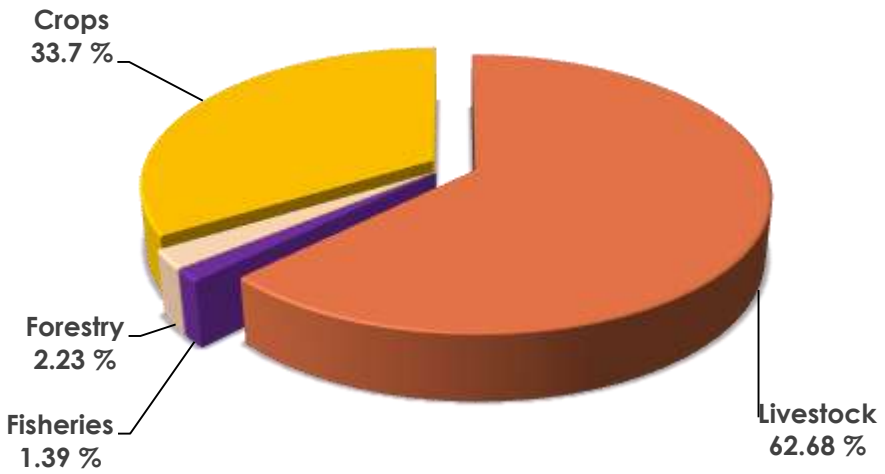
The Pakistan dairy industry faces multiple challenges. The issues mainly include small and scattered holders, making milk collection difficult and expensive, wastage of 20% milk due to poor marketing infrastructure, the dominant role of the traditional system of milkmen and contractors who do not have appropriate facilities for milk handling, limited and disjointed cold chain, malpractices, and profiteering attitude of the marketing agents, lack of market information, capping of prices by the district administration, limited value addition, lack of credit facilities, weak institutional support, rampant poverty adversely impacting children's milk consumption, gender bias, and lack of stakeholders' capacity to efficiently deliver, etc.

Despite various constraints, milk production has exhibited an increasing trend. Increasing demand and more precisely an existing supply-demand gap can easily absorb any significant increase in production or supply. Therefore, the future of the dairy industry seems to be quite encouraging.

Pakistan Dairy Industry

Livestock plays an important role in the national economy. It contributes 14.36% to GDP. Its share in the value of all agricultural commodities is 62.68% (Figure 1):

Figure 1: Value of Agriculture Commodities



Source: Pakistan Economic Survey 2022-23

Figure 1 clearly shows that livestock alone contributes more than all others combined including crops, fisheries & forestry towards the value of agricultural commodities.

Livestock is one of the major sources of livelihood for small marginalized and landless stockowners. Over 8 million families are directly involved with production and marketing of livestock. Several products from livestock are part of the food basket and a source of high-quality nutrients.

Structure of Dairy Forming in Pakistan

The structure of dairy farming in Pakistan is predominantly characterized by small and landless farmers. Livestock farmers can be categorized into small (small-subsistence with 1-2 animals and semi-subsistence with 3-4 animals), medium (having 5-10 animals), and large (commercial with 11-20 animals and market-oriented with 21 or more animals). Based on this categorization, households falling into the category of small farms constitute about 85.4%.

Livestock population:

Table 2.16: Estimated Livestock Population (Million Numbers.)

Species	2020-21[1]	2021-22[1]	2022-23[1]
Cattle	51.5	53.4	55.5
Buffalo	42.4	43.7	45.0
Sheep	31.6	31.9	32.3
Goat	80.3	82.5	84.7
Camels	1.1	1.1	1.1
Horses	0.4	0.4	0.4

Livestock Production Systems

The major system is the subsistence type, with more than 50% of cattle and buffalo maintained in herds of less than six animals. Similarly, over 60% of the goat population is kept in flocks of less than 30 animals. Sixty percent of the sheep population, however, is kept in units of 50 to 350 animals.

Livestock under the subsistence production system is inherently prone to several constraints. The resource base is weak, and management practices are obsolete. Feeding is improper, and protection against diseases is haphazard and undefined. Livestock falling into this category constitutes about two-thirds of the total population of the country. Breeding practices are faulty, and livestock remains exposed to one or another problem without ever attaining its genetic potential.

The number of small farms is continuously increasing due to land division under inheritance law. On such farms, crop-livestock mixed farming is practiced. The livestock kept matches the demands of the farming family. Over 50% of the population of both buffalo and cattle is raised in units of less than six animals.

More than two-thirds of the total livestock population of Pakistan is maintained on small, resource-scarce farms. As the demand for livestock products increased, small-holder subsistence livestock farming slowly started getting replaced by semi-commercial farming setups in rural and peri-urban areas.

Over 50% of the population of cattle and buffaloes is raised under a low-input production system at subsistence farms. Over 30% of the remaining buffaloes are raised under market-oriented semi-commercial rural farms with a medium-input production system. Medium-sized cattle herds (7-20 cows) comprising mostly local milch breeds such as Sahiwal and Red Sindhi, and some crossbreeds, are also raised under the latter system. Peri-urban commercial herds, however, practice medium to high-input production systems, covering about 5% of the population of dairy animals.

Recently, large commercial dairy farms have been established in various parts of the country, which are highly mechanized and maintain highly productive breeds of Holstein Friesian, producing more than 9,000 liters of milk per lactation. The number of large commercial and corporate farms is increasing owing to the favorable environment for milk production in Pakistan.

Livestock (Dairy) Marketing Systems

Milk production in rural areas constitutes about 80% of the total milk production in the country. Of the remaining 20%, peri-urban production accounts for about 15% and urban production for about 5%. About 90% of the marketed milk is collected from subsistence farmers, and the remaining 10% is contributed by commercial dairy farms.

Milk Production and Supply

Milk is the largest product of the livestock sector, accounting for 60% of the total value of livestock produce. Only 20-25% of the total milk output is channeled into the urban marketing system. Small dairy farmers account for 80% of the marketed milk. With the increase in milk prices and pressure from higher production costs, even small-scale milk producers sell part of their milk after meeting their household consumption needs. The family's decision to sell milk, and the amount to sell, is clearly poverty driven. Small farmers sell milk only because they have no other source of cash income.

With high population growth, urbanization, income growth, and diversification of diet towards high-value agricultural products, per capita milk consumption has increased from 51 liters per annum in 2010 to 218 liters per annum in 2023 (Pakistan Economic Survey 2022-23). Fresh milk pasteurized UHT milk, ghee, and yogurt are major dairy consumption items in Pakistan.

The dairy industry in Pakistan is underutilized. At present, it is operating at about 50% of its installed capacity, with a total processing of only 2-3% of the milk produced in the country. The preference for raw milk throughout Pakistan is based on considerations of good quality, taste, and affordability. Domestic production of fresh milk has been unable to keep pace with domestic demand, as shown in the following table:

Fresh Milk Production and Consumption up to 2023
(Pakistan Economic Survey)

Table 2.17: Estimated Milk and Meat Production			(000 Tonnes)
Species	**2020-21[1]**	**2021-22[1]**	**2022-23[1]**
Milk (Gross Production)	**63,684**	**65,745**	**67,873**
Cow	23,357	24,238	25,151
Buffalo	38,363	39,503	40,678
Sheep[2]	41	42	42
Goat	991	1,018	1,046
Camel[2]	932	944	956
Milk (Human Consumption)[3]	**51,340**	**52,996**	**54,707**
Cow	18,686	19,390	20,121
Buffalo	30,691	31,603	32,542
Sheep	41	42	42
Goat	991	1,018	1,046
Camel	932	944	956

Milk Marketing Infrastructure

The usual concept of organized markets is not prevalent in the case of milk. In other words, no markets for milk exist like food grain markets, fruit and vegetable markets, or even livestock markets. The marketing system for milk is predominantly informal and is characterized by the presence of a number of small-sized farmers, milkmen, milk processors, milk/dairy shops, and vendors operating at different stages of milk collection and distribution. Milkmen are the main intermediaries linking milk farmers in rural areas with consumers in urban centers. The milk is handled in a crude way. A typical milkman owns a few metallic containers/cans or plastic drums. The milkman transports milk in these containers to shopkeepers who maintain a set of boiling pans, buckets, and earthen pots for making yogurt.

Milk Collection & Handling Utensils

Milk processors have introduced an organized system of milk collection. They have introduced chillers and refrigerated carriers. These initiatives have been supplemented by development projects initiated by the government. Milk processors, especially Nestle, Haleeb, Engro, etc., have set up collection centers in milk production areas where they have created basic infrastructure in the form of chillers. The milk collected at these chillers (Nestle calls them Village Milk Collection Centers) is transported to sub-centers and processing plants in refrigerated carriers. This has provided competition to the traditional milk collection system dominated by milkmen and has thus enabled rural farmers to obtain better prices.

Modes of Transportation

A variety of modes of transportation are used for milk collection from farmers in rural areas to processing plants, shopkeepers, and consumers in urban centers. Bicycles, motorbikes, three-wheelers, animal carts, etc., are used for collection and haulage of milk in small volumes ranging from 200 liters to 500 liters. Larger volumes are transported in Suzuki pickups, Hi-Lux pickups, Shehzore, and Mazda mini-trucks. The bus roof tops are also used for haulage of milk from rural to urban centers. The risk of milk spoilage during transportation is higher in summer than in winter. Milkmen add ice, water, and chemicals to minimize the risk of spoilage.

Milk Marketing Chain

The milk marketing (value/supply) chain is characterized by the presence of a number of middlemen or intermediaries operating at different stages along the distribution chain. The following table briefly describes the types of players operating in the value/supply chain:

Economic Agents Involved in Milk Marketing Chain

Market Player	**Description**
Milk Producers	Rural subsistence farmers, rural market-oriented farmers, commercial dairy farmers, & city and peri-urban milk producers
Milk Collectors	Milk Man, village milk collection centers, contractors, mini supplier etc
Milk Processors	khoya makers, confectioners, pasteurizing plants, UHT milk
Milk Retailers	Milk shops peri-urban farmers, rural subsistence and market oriented farmers, retail shops
Milk Consumers	Consumers of fresh milk direct from farmers, consumers of gawala milk, consumers of fresh milk from milk shops, consumers of UHT poly/tetra pack

Problem Statement

The present condition of the global dairy market presents both opportunities and challenges for Pakistan's dairy sector. On the one hand, Pakistan is among the top five milk-producing countries in the world, so the increasing demand for dairy products offers a promising avenue for export growth. On the other hand, intensifying competition from established dairy-exporting nations and evolving consumer preferences necessitate a strategic approach to enhance Pakistan's market access and product competitiveness.

Scope of the Study

During this study, the focus remained on the livestock policies of the federal and provincial governments, with specific focus on KP and Punjab. The implementation strategies and stakeholder engagements were also analyzed.

The critical issues like low yield of milk per animal, low quality and quantity of milk, supply chain bottlenecks, value chain inefficiencies, and lack of investment were evaluated considering various frameworks of analysis like situation analysis, SWOT analysis, critical analysis of current policies, gap analysis, stakeholders' analysis, and policy framework matrix. A comprehensive set of issues and challenges has been identified and practical policy recommendations drafted to address those.

Research Methodology

Both qualitative and quantitative research tools will be used. Different analytical techniques like SWOT, Gap, Situational, Stakeholders, Critical, Comparative, and Logical framework matrix analysis will be used. More reliance will be placed on secondary data; but some primary data was also collected based on interviews conducted by the Group.

Analysis

Situational Analysis - Milk Production Potential in Pakistan

Milk production is an important aspect of Agriculture in Pakistan, with a population production of some 75 million tons in 2024 and the 4th largest milk production country in the world after the USA, India, and China. Milk production is a major source of income for many people in Pakistan, particularly the lower middle class in the rural areas of Sindh and Punjab, and livestock is the basis of it.

Livestock has a share of 62.68% in the agriculture sector in Pakistan and a 14.36% share in GDP growth (Abdul Sitar - Agriculture University Faisalabad 2019). After the 18th amendment to the Constitution of Pakistan, there arose a need for formulation of policies to be adopted by the provincial governments. Hence, the provinces of Punjab, Sindh, and Khyber Pakhtunkhwa formulated their livestock policies with particular emphasis on milk production and dairy development and its related sectors of processed milk, ghee, curd, butter, cheese, etc., as the potential was huge in terms of the domestic market and to have it exported to other countries for capital gain.

Global milk production was 944 million tons in 2023, and with an increase of 0.90%, Pakistan is the 4th largest milk-producing country after India, the USA, and China, with a production of some 65 to 75 million tons of milk production of cow and buffalo in 2023. However, the estimated production is much more than that and is estimated to be between 82-110 million tons breeding potential capacity, and hence the sector has a huge potential with regard to the export of dairy products if used in a proper way and would earn a huge amount of capital.

Dairy farming is fragmented and practiced on various levels in rural, semi-urban, and urban areas, mainly by the private sector. Buffaloes produce 62% milk, while cows produce 34%. 80% of milk is produced in rural areas, and 15% in peri-urban or semi-urban areas (Dairy Development in Pakistan, Uma Zia, Talat Mahmood, and Morale, Rome, Food and Agriculture Organizations (FAO) of the United Nations 2011, Rome 2011). However, the milk production is not enough for the demands of a 241 million population growing at a rate of 2.55% annually (Pakistan Bureau of Statistics PBS 2023 Census). The demand for milk consumption is estimated at 5% annually in the coming years (Arijo 2018 - What is Holding Back Milk Production Potential in Pakistan - Abdulsattar - PIDE Islamabad 2019). World milk production is likely to increase at 1.6% per annum by 2025 to reach 997 million tons. India, the USA, and Pakistan would be producing 255, 107, and 64 million tons, respectively. The expected production in India and Pakistan will contribute more than 30% to world milk production (FAO 2020).

According to Mr. Muhammad Tariq, Development of Livestock Management, University of Agriculture Faisalabad, the biggest challenge faced by the dairy sector is the limited access to quality feed resources (Tariq and Tahir et al., 2019). The major feed for dairy farming is fodder, mineral supplements, balanced feed, hay and silage making, hydroponic fodder, and pasture management for increasing milk and dairy production.

The daily breeding practices for high milk production are Holsteins-Friesian, Jersey, and crossbreed (Hasan and Khan 2013). However, one major issue is the lack of genetic breed resources, which small farmers find difficult to afford to purchase high-quality breeds. Hence, the production of milk and dairy products is being affected (Fossa et al. 2023).

The top milk-exporting countries in 2023

Dairy products, especially milk, are not just a staple of our diets but are also valuable commodities in international trade (Spencer Whitefield, 20 September 2023, LinkedIn).

The top milk-producing countries in the world are:

1. New Zealand, the global leader in dairy products exports milk powder, butter, and cheese, contributing significantly to export revenue.
2. European Union, collectively exporting a diverse range of dairy products like milk, cheese, butter, yogurt, and milk powder, characterized by quality standards and a well-established market presence.
3. USA, a key player in dairy product trade, exports a variety of cheese, milk powder, butter, etc. Its dairy sector benefits from modern farming practices, advanced processing facilities, and a strong presence in the global milk market.
4. Australia, known for high-quality dairy products, is a significant player on the world stage, supported by modern farming techniques and stringent quality control measures.
5. Belarus has significantly risen in recent years, with a focus on the Russian market and has benefited from its proximity to international dairy trade.
6. Argentina is another international trade bearer of dairy products, and its industry is highly characterized by its standards and commitment to international regulations.
7. India is another key player in dairy farming and product exports, exporting skimmed milk powder and dairy products. Its milk industry is characterized by traditional and modern farming practices, making it an important contributor to global dairy product trade.
8. Brazil has expanded its overall development in the dairy sector, benefiting from its reputation for high-quality dairy products.
9. Canada is another global dairy product exporter, particularly cheese. Its dairy products are highly appreciated and regarded in the world and play an important role in the country's overall agricultural export industry.

The dairy marketing system in Pakistan is based on the private sector organization comprising dairy farmers, milkmen called "Dhodi" in the local language, milk processing units, and consumers. But milk is circulated and marketed without pasteurization and chilling, and hence most of the time it gets damaged due to bacterial attack, and farmers must lose on a very high economic level. Only 4-5% of milk is processed (UHT), while 15-20% of milk is wasted in some areas of Pakistan (PIDE 2021, Abdul Sitar "What is Holding Back Milk Production Potential in Pakistan?").

Milk production in Pakistan (million tons)

Year	Buffalo	Cow	Goat	Sheep	Camel	Total
1961	4	1.7	0.09	0.02	0	6
1971	5	2.1	0.19	0.02	0	8
1981	7	2.2	0.44	0.44	0	9
1991	11	3.7	0.53	0.04	0	15
2010	22.	12.4	0.74	.04	0	35
2019	34	21	0.94	.04	.20	57

Source: FAO Country Statistics Camel, milk data, 2019

Labano and Soomrro (2006) forecasted that milk production would see an annual increase of 4.2% in the next decade in Pakistan, but the milk demand would rise up to 15%, much higher than the 3-4% annual production increase. Production increased three and a half times between 1991 and 2019. Buffaloes and cows are the main contributors to milk production during this period.

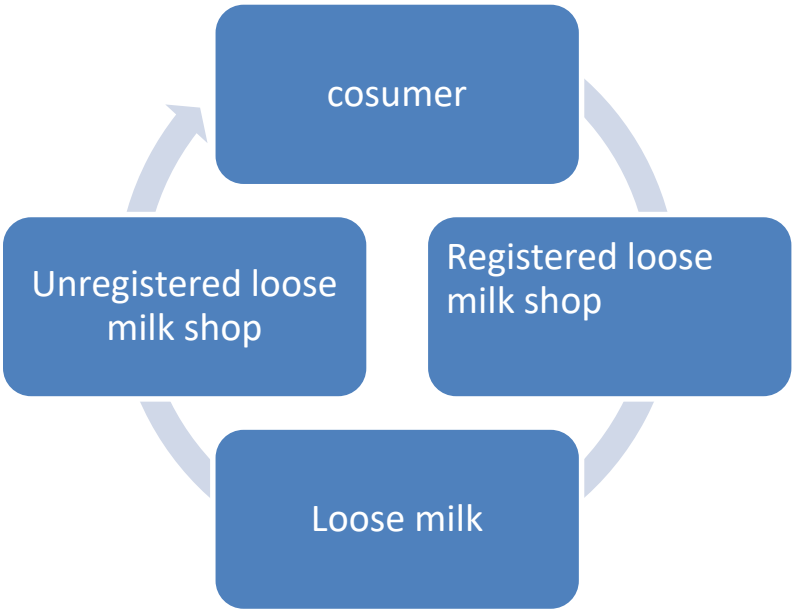
Imports of dairy products have been a concern although the country is producing dairy products on a large scale, it has also been importing around 86,000 tons of milk products up to 2019, including skimmed dried milk and 11% whole dried milk.

The details are as under:

Year	Imported (M Ton)	Quantity (Million Dollar)	Export (Million Tons)	Value (Million Dollars)
1961	5216,	2	0	0
2013	25054	77	45558	74
2015	51577	186,	31399	46
2017	50116	138	25183	35
2018	48798	132	26309	27
2019	86498	140	18484	14

Source: FAO Country Statistics 2019

Supply chain of loose milk



Province wise Production of Milk in Pakistan

Punjab 63%, Sind 23%, Khyber Pakhtunkhwa 12% and Balochistan 2% (Trade Development Authority (TDAP) Data 2022-23).

Dairy Products Being produced in in Pakistan (especially in Punjab)

Pakistan Dairy Information (Pakistan 1st Dairy Farming Guide)

Species	**2020-21**	**2021-22**	**2022-23**
Milk (Gross Production	63684	65745	67873
Cow	23357	24238	25151
Buffalo	38363	39503	40678
Sheeps	41	42	42
Goat	991	1018	1046
Camel	932	944	956
Milk (Human Consumption)	51340	52996	54707
Cow	18686	19390	20121
Buffalo	30691	31603	32542
Sheep	41	42	42
Goat	991	1018	1046
camel	932	944	956

Milk Marketing Chain

Economic agents involved in milk marketing chain

Market player	Description
Milk producers	Rural subsistence farmers, rural market oriented, commercial dairy farmers, and city and peri-urban milk producers.
Milk collectors	Milk man, village milk collection centers, contractors, mini supplier etc.
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Milk retailers	Milk shops peri-urban farmers, rural subsistence and market oriented farmers, retail shops
Milk consumers	Consumer of fresh milk direct from formers, consumers of gawala milk, consumers of fresh from milk shops, consumers of UHT poly/ tetra pack.

Swiss dairy products giant has made Pakistan the home of the world's largest production plant. The millions-of-liters-per-day Punjab-based processing facility will rise to new dimensions soon as Nestle has been collecting milk from up to 140,000 to 160,000 farmers in an area of over 100,000 square kilometers milk network in Punjab (Pak positive 23/4/2008). Nishant Dairy is another company contributing to dairy product production in Punjab, Pakistan, part of the Nishat Group of Companies.

At the federal level, a national integrated approach has been adopted towards livestock. The Livestock & Dairy Development Board (LDDB) has been established for agribusiness, under Section 42 of the Companies Act 1984. The vision is the development and promotion of livestock for food security. Sustainable development of all segments, including milk and its allied products, has been taken into consideration with the aim of alleviating poverty, generating employment, and driving economic growth through the export of milk and its products.

Estimated National Herd Population of Livestock (from 2018-2023) in Millions.

Species	2018-19	2019-20	2020-21	2021-22	2022-23
Cattle	47.8	49.6	51.5	53.4	55.5
Buffalo	40.0	41.2	42.4	43.7	45.0
Sheep	30.9	31.2	31.6	31.9	32.3
Camel	76.1	78.2	80.3	82.5	84.7
Gaot	1.1	1.1	1.1	1.1	1.1
Horses	0.4	0.4	0.4	0.4	0.4
Asses	5.4	5.5	5.6	5.7	5.8
Mules	0.2	0.2	0.2	0.2	0.2

Source: Livestock and Dairy Development Board

The low production of milk is a concern for the country, and we are suffering from low productivity and, as a result, low exports. Hussain *et al*, in their research article "Factors Affecting the Milk Production in Buffaloes, A Case Study," writes that factors affecting the production of milk include not using good fodder, especially green fodder, the number of lactations, and the number of labor hours for caring for the animals. Generally, the Pakistan milk industry is known for not yielding high-yielding cattle.

The yielding milk production is very low in Pakistan compared to New Zealand, Australia, Turkey, the Netherlands, and the USA due to the shortage of fodder or due to the high cost of fodder. However, the shortage of green fodder is affecting production more (Modernizing The Dairy Sector March 2022 - Pakistan Business Council). Green fodder is the primary determinant of animal productivity and milk production and, therefore, a fundamental component of the input cost of dairy farming. The total cost of feed is 60% of the total dairy farming cost for cattle and 80% for buffaloes. In an observation in district Jhang in Punjab during a research study to monitor the effect of fodder over a period of 2 months, a 2.64% increase was observed in milk production with the increase of 1% green fodder to the animals. Similarly, if the number of lactations was decreased and made systematic, then the milk production would increase again.

Green fodder is cultivated on 6.1 million acres of land (2.4 million hectares) in Pakistan, which is only 9% of the total cropped area of 67.9 million acres (27.4 million hectares). The land cultivated for green fodder is insufficient for feeding the dairy animals and is leading to animal health issues and low milk production or yield. Corporate farms use a combination of green fodder and silage to ensure high milk production. The sources of feed include green fodder (the most nutritious element of fodder), silage, concentrated salts, and other substitutes. Five kilograms of fodder is needed for 1 kg of milk production on a daily average. But green fodder has a reduced or decreased supply for some 5 months between May and September-October. Hence, silage is used during this period, but that doesn't increase production. Other substitutes for green fodder include local Wanda, by-products of wheat and sugarcane. Soybean as fodder for animals may also help in this regard.

Regularization of the sale of raw milk, like in other developed countries, is a key to increasing its overall product value. In the UK, USA, Canada, India, and China, the pasteurization of milk is a necessity, but here in Pakistan, it is not done, making it unsuitable for export to other countries and, at the same time, the unhygienic trend is also flourishing.

The demand for milk powder is also increasing, and Pakistan has imported 40,000 tonnes of dried milk in 2020, worth approximately 75 million dollars. The Livestock policy on the federal level was introduced in 2007 but only for a short period of time. After the 18th amendment, the provinces were given the task of implementing livestock policies. Punjab, Sindh, and Khyber Pakhtunkhwa formulated their policies with a special focus on livestock and dairy development.

The Punjab Livestock Department initiated a program named "Milk supply chain study and business model development for the value addition/conversion of Milk into whole and skimmed milk," in the flush season in Punjab on 6th October 2016. The objective was to develop a detailed milk supply chain study and business model for value addition. The study was conducted with interviews with producers, distributors, and processors. Some 8 million families are directly involved in livestock raising, deriving more than 35% of their income from livestock production activities (Economic Survey 2015-16).

The Livestock and Dairy Development Department Punjab has developed the 9211 Virtual Governance platform, acting as a comprehensive database with real-time information on farmers and their livestock in the province. 1174 farmers were trained on better animal husbandry practices. And this has proven vital for milk production and livestock development in the long run in Punjab and ultimately in the economic growth of Pakistan.

The involvement of non-governmental agencies or organizations, particularly those belonging to developed countries, is also a positive part of enhancing milk production or dairy product development. One such project was initiated by Idara e Kisaan for alleviating poverty through the resurrection or renaissance of dead milk plants in Punjab and Sindh. Idarae Kisaan, formed under the Societies Act 1984, started in 1983 through an agreement between the German company GTZ and Pakistan, aiming at "Increasing the income of small landless livestock breeders in the irrigated Punjab through improvements in livestock production." Patoki Livestock Production was designed under the agreement. An important factor was that they earned the goodwill and confidence of the people, offering an option to breeders against the exploitation of the "Dhodis" - the middlemen. The people were given an opportunity for breeding with a reliable market for their produce, free veterinary services for helping, improving quality feed provision, and increasing income through increased milk production (Milk plants; a turnaround with a difference, Dawn July 21, 2003).

The analysis shows a 29% higher net return per milk per animal (Khalid Riaz 2008, A Case Study of Milk Processing; The Idara e Kisaan Cooperative). Starting from a small village in Haala in Kasur, the project was expanded to other districts like Okara, Sheikhopura, Sahiwal, Pakpattan, and Bhalwal tehsil, covering some 430 villages. Women were also involved in the process with their inclusion in health and livestock committees.

On the professional side, the production of the Lahore Milk Plant was increased to 300,000 liters per day from 45,000 liters, and that of the Islamabad Plant from 16,000 to 50,000, and Patoki from 15,000 to 18,000 liters per day. A plant in Karachi was also revived, making it workable for processing by Idara e Kisaan.

As per the statistics of Statista Market Insights, November 2023, the revenue in the Milk Market amounts to 6.04 billion dollars. The market is expected to grow annually by 6.36% (CAGR 2024-2028). India generates a revenue of 71 billion dollars in 2024. The market milk volume is expected to reach 7.46 billion kg by 2028 in Pakistan. The expected volume growth of 1.8% is expected in 2025.

Dairy farming production systems are classified into traditional and modern farming practices. More than 12,000 commercial dairy farms operate in Pakistan (mostly in Punjab), 75% of which are small-scale enterprises (Tahir et al. 2019). The low input-output methods used by small-scale farmers result in low productivity and low-quality milk (Riaz 2008). Modern dairy farming revolves around large-scale commercial farming with the use of high-breeding animals having larger production. But here, the case is reversed, and the situation is not very different, and the milk production is by far residing with the small farmers, not contributing much to the milk production and, at large, to the national economy.

The present breeding strategies for high milk production involve the use of high-yielding exotic breeds such as Holstein Friesian, Jersey, and crossbreed (Hassan & Khan 2013). But the major concern is the lack of genetic breed diversity (Tahir et al. 2019). Many small-scale farmers cannot afford to purchase expensive animals, hence limiting milk production (Fossa 2023). Animal healthcare is another crucial issue in Pakistan (Ghafar et al. 2020) with a lack of access to veterinary healthcare. Poor nutrition and poor housing, contributing to poor health and welfare of animals, result in low productivity of milk (Gawarski and Backowski 2022, Tariq et al. 2020). Animal cruelty and abuse are also affecting animals and, hence, their production (Hussain et al. 2020).

With the consideration of good climate, feeds and water, space hygiene, spatial housing intervention, and animal health improvement, the production of milk may thrive, and Pakistan may increase its potential in exporting dairy products.

The involvement of women in dairy farming and product development is another key player initiated by the Punjab provincial government. An initiative "Women's Livelihood through Dairy Development" was launched in 2015 in collaboration with NGOs to empower women (Yasin and Yuko 2015). An initiative of cow giving was also launched in the merged district of Orakzai of Khyber Pakhtunkhwa in 2022, where 200 cows were distributed among the people of Upper Tehsil Ghiljo and Lower Tehsil Kalaya (Islamic Relief Pakistan, District Administration Orakzai 2022 data collected directly), with a clear emphasis on getting women (widows) involved in caring for the cows and empowering women.

SWOT Analysis of Livestock Department KP

Strengths	**Weaknesses**
1. KP Livestock Policy 2018 already formulated 2. KP Livestock Strategic Plan and Business Development Plan already in place 3. Livestock Department separated from Agriculture department	1. No Corporate and no Cooperative dairy farms in KP 2. Very low yield of milk per animal 3. No indigenous breed of KP 4. No genetic improvement 5. Weak value chain and supply chain
Opportunities	**Threats**
1. 20% Per Anum increase in demand of milk in KP 2. Proximity to Afghanistan and China where milk can be exported 3. Special Economic Zones already exist in KP where Dairy processing plants can be setup 4. Model cattle colony and Harichand cattle farm	1. Foot and mouth disease 2. Lumpy skin disease 3. Weak implementation

SWOT Analysis of TDAP

Strengths	**Weaknesses**
1. Strong Organizational Structure 2. Government Support 3. Strong Resource Network in form of Pakistan embassies 4. Strong market knowledge of Agro economy	1. Failure in export promotion 2. Bureaucratic way of doing business 3. Weak connections with the businessmen 4. Low profile/ Non activism
Opportunities	**Threats**
1. Harnessing huge export opportunities 2. Signing of free trade agreements with regional and friendly countries 3. Guiding the exporters for value addition of their products 4. Export Diversification	1. increasing competitive global market 2. Security situation in the country 3. Political Instability in the country 4. Fluctuating nature of the Global market in wake of Ukraine war

Stakeholders Analysis of Livestock Sector of Pakistan

Stakeholders	**Interest**	**Influence**
Producers	Higher profit margin Higher yield High quality and quantity	Low influence as they are not well organized Especially the subsistence farmers majority
Processors	Supply chain optimization Value chain efficiency Pasteurization law and more milk in formal sector	Standardization Quality control Low in influence as they are not very high in number
Distributers / Retailers	zero rated status for the dairy sector Economies of scale	The PDA and other big milk packaging lobbies are well organized and have high influence

Gap Analysis of Livestock Sector of Pakistan

Current State	Key Steps to bridge Gap	Desired State
➢ Very low yield ➢ Low quality and quantity ➢ Almost zero export ➢ Relatively high import ➢ FMD, LSD, HS prevalence ➢ 95pc milk in informal sector ➢ Oxytocin injections hormones ➢ Lack of trained HR	➢ Livestock Census ➢ Livestock policies implementation in earnest ➢ Safe milk policy ➢ Pasteurization law ➢ No price fixation of fresh and loose milk by government ➢ Ban on imported milk ➢ Tax incentives for exporters ➢ Industry Academia linkages	➢ High yield, good quality and quantity ➢ Zero imports ➢ At least $1 billion exports ➢ Value addition and supply chain optimize ➢ Efficient and effective regulation of sector ➢ Trained HR

Evaluation of Existing Policies at Federal and Provincial Level

Ministry of National Food Security and Research

As Per Rules of Business 1973, some major functions of the Ministry are:

- Economic Coordination and planning in respect of food, economic planning and policy making in respect of agriculture
- Imports and exports control on
- Food grains and foodstuffs, inspection, grading analysis of food grains and foodstuffs,
- Maintenance of standards of quality for import and export and inspection, handling, storage and shipment

For livestock and dairy sector, there are following attached departments of the Ministry:

- Livestock and Dairy Development Board (LDDB)
- National Veterinary Laboratory, Islamabad

Livestock & Dairy Development Board: envisages the creation of linkages among stakeholders of livestock value chain for facilitation of sector related business and B2B linkages. The Board has been set up to plan, promote, facilitate and coordinate the accelerated development and investments in livestock, poultry and dairy sectors. It also focuses on promotion of marketing of livestock and the allied products.

It has the following Objectives.

- Plan, promote, facilitate and coordinate the accelerated development of and investment in the livestock, poultry and dairy sectors.
- Promote and facilitate marketing of livestock & livestock products.
- Promote and facilitate producer-owned & controlled organizations.
- Undertake capacity building of all stakeholders.
- Facilitate, promote and support the development and dissemination of improved technologies.

Role of Ministry of National Food Security and Research in the Dairy Sector

Dairy, a sub-sector of livestock, is among the most significant livestock products and, in many rural areas, is perhaps the only source of nutrition, especially for children. Despite its importance, the sector operates at a subsistence level and requires attention at both federal and provincial levels. Since the livestock sector was devolved to provincial governments following the 18th Amendment, the federal government can contribute to the dairy sector by introducing regulatory mechanisms aimed at enhancing milk production in the provinces.

National Food Security Policy

Under the strategic framework of the National Food Security Policy 2018, Pakistan aims to exploit untapped trade potential across all agricultural sub-sectors, including dairy development. One key constraint to farm-level mechanization is the lack of machinery for small-scale dairy farming. To address this issue, the import of machinery for hay/silage making, milking, and dairy and meat products will be incentivized. As a policy measure, the private sector will be encouraged to invest in dairy production through various incentives. Additionally, the federal government should ensure the implementation of the pasteurization law across the country to address existing shortcomings.

Importance of Livestock Census

Livestock encompasses a range of products, including meat, milk, eggs, manure, fiber, hides, and horns, playing a critical role in Pakistan's agricultural sector. Livestock accounts for approximately 56.3% of the agricultural value added and contributes nearly 11% to GDP, employing over 35 million people. To support sustainable agricultural development, it is crucial for the government to expand its focus to include livestock and dairy production.

The last livestock census, conducted by the Pakistan Bureau of Statistics (PBS) in 2006, highlights the urgent need for updated data. Given that livestock accounts for 56% of agricultural output, the absence of recent data is a significant gap. The Ministry of National Food Security and Research should conduct a livestock survey every five years to formulate, implement, and scale effective growth strategies.

Milk Standardization for Exports

International standards facilitate trade by creating a common language for trading partners, enabling product compatibility, reducing trade barriers and production costs, and supporting firms in global supply chains. Milk standardization regulates the fat content of milk through the complete or partial removal of fat or the addition of fat or other ingredients, ensuring precision in every pour. For Pakistan's dairy products to be accepted in international markets, the federal government should establish and enforce parameters for milk standardization.

Importance of Milk Standardization

Standardization of dairy products is essential for exports for two main reasons:

1. **Regulatory Compliance:** Different countries have varying regulations and standards for food safety, quality, and composition. Standardization ensures that dairy products meet the importing country's regulatory requirements.
2. **Meeting Consumer Expectations:** Standardization aligns products with consumer expectations in international markets, enhancing their acceptance and competitiveness.

KP Food Security Policy 2021

The Government of Khyber Pakhtunkhwa introduced the Food Security Policy 2021, which focuses on ensuring the availability of all forms of food. For the dairy sector, the KP government has outlined policy guidelines to support potential private livestock breeding farms for high milk and meat productivity. These farms will be patronized and certified, and dairy and meat production in the private sector will be incentivized through provincial government programs.

KP's strategic plan emphasizes strengthening disease surveillance, monitoring, reporting, and control mechanisms through staff restructuring and capacity building. Additionally, the plan seeks to enhance coordination between farmers and the private sector.

Punjab Livestock & Dairy Development Policy

Dairy productivity in Punjab is only 22% of global benchmarks due to heavily underfed animals, inadequate protection against disease, and poor extension and husbandry services. Eighty percent of smallholders, who constitute 90% of breeders, are landless. The fragmented milk supply chain is characterized by high collection costs. The Punjab livestock policy centers on promoting private enterprise. The policy emphasizes that the private sector should lead, while the government acts as a facilitator and stabilizer of the business environment. This collaborative approach is the cornerstone of the proposed policy, aiming to transform the province's dairy sector.

Comparative Analysis for Two Developed Countries

Country	Population in Million	Dairy Exports in US$ Billion / annum	Milk Yield (Kg / animal)
Pakistan	231	0.3 (0402)	1,461
New Zeeland	5.3	6.9 (0402)	5,787
China	1,412	2.4 (0402)	5,647

Source: FAO & Trade Map &WDI

Comparative Analysis for Two Developing Countries

Country	Population in Million	Dairy Exports in US$ Billion / annum	Milk Yield (Kg / animal)
Pakistan	231	0.3 (0402)	1,461
Turkey	84.8	17.3 (0402)	3,158
India	1,417	10.8 (0402)	1,698

Source: FAO & Trade Map & WDI

Dairy Industry of Pakistan: Issues and Constraints

The first and foremost issue in the livestock sector in general, and milk production in particular, is the reliance on estimates and guesstimates due to the lack of authentic data. No livestock census has been conducted at the national level to ascertain the exact number of animals and the accurate milk production figures in Pakistan.

Most dairy farmers in Pakistan (80%, as per the Pakistan Business Council Report, 2022) own only 1 to 4 animals. These farmers cannot adopt modern practices and techniques due to a lack of resources and economies of scale.

They are unable to store surplus milk, resulting in significant wastage (Economic Survey of Pakistan, 2023; PIDE, 2021; Sattar et al.).

Seasonality is another major impediment in realizing Pakistan's true milk production and export potential. Most milk is produced in winter due to the availability of green fodder, lower temperatures, and reduced animal sweating, conditions favorable for enhanced production. However, milk consumption during winter is low. Conversely, in summer, when demand is high, production decreases. This leads to milk wastage in winter due to inadequate storage and processing facilities.

The prices of loose milk are fixed by the government, but the prices offered by milk companies to farmers are unregulated. Similarly, the government does not fix the price of packaged milk. Milk-producing and marketing companies, as well as the packaged milk industry, are well-organized and well-represented in policymaking corridors. Consequently, they have secured numerous concessions from provincial and federal governments, including tax breaks and other incentives. Despite the dairy industry's zero-rated status, the prices of packaged milk have increased exponentially.

Vaccines for livestock diseases are imported and not readily accessible to small farmers, who are often illiterate. Veterinary doctors are also unavailable in rural areas to guide dairy farmers. This results in a high prevalence of diseases such as Foot-and-Mouth Disease (FMD) and Hemorrhagic Septicemia (HS), leading to livestock mortality and low yield.

Milk produced in Pakistan is inferior in both quality and quantity (Pakistan Dairy Association, 2022). The quality is poor due to genetic issues and substandard feed and fodder, while the quantity is low due to reduced yield per animal. The milk yield per animal in Pakistan is among the lowest globally and the lowest compared to neighboring countries. The increase in milk production observed over the past two decades is primarily due to an increase in the number of animals, not an increase in per-animal yield (PIDE, 2022). Increasing the number of animals will ultimately exacerbate greenhouse gas emissions; therefore, enhancing productivity is a better option.

The yield of Pakistani-origin cow breeds is roughly one-third that of imported Australian breeds. The genetic quality of Pakistani cattle is compromised due to genetic contamination, unregulated crossbreeding, lack of technical knowledge, and outdated artificial insemination techniques.

Milk wastage is exacerbated by manual milking practices and unhygienic conditions during milking. Middlemen also hinder farmers from expanding their herds, as they capture most of the profits. The dairy value chain, including farm-to-market roads, is inefficient and fragmented.

Additionally, the feed provided to animals is neither balanced nor nutritious, resulting in lower milk quality and quantity.

The import of dry and liquid milk poses a significant challenge for a country facing a severe balance of payments crisis. The dairy value chain lacks value addition, such as the production of value-added products like infant formula and cheese. Diseases such as Foot-and-Mouth Disease, which affect animal health, productivity, and export potential, have been imported due to weak quarantine and vaccination arrangements.

The certification and tagging of animals for health, vaccination, and breed management, as well as the development of a national breeding policy, have been delayed, causing significant losses to the dairy sector. The genetic quality of the national herd, particularly in Punjab, is declining rapidly due to the killing of calves.

Corporate dairy farming and vertically integrated farmer cooperatives constitute less than 10% of Pakistan's annual milk production and sales (Idara-e-Kissan, Halla case study, 2011). This inefficiency stems from subsistence farming practices involving herds of fewer than 10 animals. Unlike agriculture, livestock farming requires higher initial capital investment. Farmers need access to credit and insurance to expand their herds, but these are unavailable in Pakistan, as banks rarely lend to livestock farmers who lack bank accounts or collateral. Livestock insurance is another critical issue, especially in the aftermath of massive livestock losses during the 2022 floods.

Low per-animal yield is further compounded by limited opportunities for open grazing, physical security concerns in rural areas, and the poor quality of feed. The availability of imported pasteurized bottled milk in Pakistan, despite its high cost, highlights inefficiencies in the local dairy sector and lax import policies. Pakistan, one of the top five milk-producing countries globally, paradoxically imports high-value dairy products due to the absence of local value addition.

There was no dedicated livestock university in Pakistan until 2018, resulting in weak industry-academia linkages and limited improvement in livestock genetics. Due to the low number of qualified veterinary doctors, quacks dominate rural areas, causing more harm than good. Growth hormones and milk-increasing steroids like oxytocin, often injected to boost milk production, are counterproductive and hazardous for human consumption.

Although laws prohibit livestock farming in cantonment and municipal areas, informal farmers, operating mainly on the outskirts of urban centers, lack properly established cattle colonies. This hampers farmers and limits the potential of bio-gas and bio-mass initiatives in the livestock sector.

The illegal slaughter of newborn calves, particularly in Sindh, where calf mortality is 80% in Karachi, reflects inefficiencies in livestock management.

Initiatives like the Punjab Cattle Market Management Development Company should be replicated in Sindh and KP, where model cattle colonies are absent. The dairy sector requires horizontal and vertical integration, especially in KP, where special economic zones could host bio-gas plants to meet rural energy needs. Programs like "Save the Calf" should be launched in KP, taking lessons from the Ministry of National Food Security's implementation plans.

To ensure the dairy sector's growth, local milk processing and packaging companies must be mandated to source milk locally. Concentrated focus on the livestock sector, and specifically the dairy sector, is crucial to addressing farmers' needs and formulating tailored development schemes. The buffalo slaughter at Bhains Colony must be stopped immediately, with the Sindh government leading efforts to improve the livestock sector.

Conclusion

- The livestock sector in general, and the dairy sector in particular, has great potential for growth. This statement has been repeated ad nauseam for the past 75 years, but no practical steps have been taken. There is a dire need to invest in this sector; otherwise, Pakistan will become a milk-deficient country in the near future.
- Despite growth in the livestock population, there has been no increase in milk yield per animal. The inter-census growth in livestock population is much higher than the growth rate of the human population.
- The examples of India, Turkey, China, New Zealand, and the Netherlands serve as models for Pakistan to emulate in achieving stellar growth in the dairy sector.

Recommendations

- The first and foremost recommendation is that a livestock census should be conducted at the national level as soon as possible to ascertain the exact milk production figures and the exact number of livestock in Pakistan's different provinces. We can no longer rely on estimates. The PBS and MNFS must take the lead in this initiative, along with the provincial governments.

- The Livestock Insurance Policy initiative of the federal government, being implemented by the SBP, is a step in the right direction. Its fiscal size should be increased, and its scope should be expanded to include livestock loans at low mark-up rates. It should be a national effort in which the federal and provincial governments share the burden 50-50. We propose stopping all new recruitment in the MNFS and limiting their projects to fund this critical project.
- The University of Veterinary Sciences being established in Swat and currently run as a project is strongly recommended to be abolished and declared as a satellite campus of the Agriculture University. The amount saved should be spent on a new project for a model cattle colony near Peshawar to cater to the needs of Peshawar and exploit export potential to China and Afghanistan.
- The livestock sector should be reflected separately in the budget and ADP to enable specialized focus on the development of this critical sector, as the term "agriculture" is too broad.
- The Secretary of Livestock KP and the DG Livestock should sign a performance agreement at the start of the new government's tenure. The government should commit the resources, and accordingly, the Secretary and DG should clearly define the goals to be achieved year by year. The goals must include one success story of a cooperative dairy farm like Halla, one mega farm like the Jahangir Tareen Farm in Punjab, cattle colony establishment, functionalization of the KP Livestock vaccine production facility, and reduction in FMD prevalence.
- Trackers should be installed in all vehicles of the Livestock Department used for vaccination and outreach activities to discourage misuse.
- The zero-rated tax regime for the dairy sector should continue. However, the Pakistan Dairy Association and the Pakistan Business Council should sign a performance agreement with specific indicators and timelines with the MNFS detailing how milk production by large farmers and multinational corporations will increase, along with specific milk export targets. In case of failure, the zero-rated status of the dairy sector should be withdrawn in the next budget, and the collected amount should be used to provide zero-interest loans to subsistence and cooperative farmers.
- Indigenous production of vaccines and medicines should be encouraged in collaboration with veterinary universities in the country by developing academia-industry linkages.
- The KP Livestock Policy, the baseline survey, the strategic development plan, and the business development plan are a good approach and should be emulated in other provinces, especially Sindh.

- There should be a national crackdown on the slaughter of underage calves and buffaloes.
- The government should not fix the price of loose and fresh milk; it should be left to market forces to decide the rates.
- The genetic quality of local livestock breeds in Pakistan must be improved by introducing the long-awaited National Breeding Policy by the MNFS.
- A micro-credit bank, the Dairy Development Bank of Pakistan, should be established to cater to livestock, like ZTBL.
- Implementation of the Pasteurization law should be carried out in full, in letter and spirit.
- The entire dairy value chain must be optimized, with specific focus on biogas and natural fertilizer.
- A national emergency vaccination drive for livestock should be initiated.
- Duty-free import of Australian cows for small farmers should be allowed to increase productivity.
- Duty-free import of animal feed should be permitted.
- The loss in revenue will be more than compensated by the increase in milk production.
- The import of liquid milk, such as Almarai, should be totally banned to save precious foreign exchange and promote the local industry.
- The MNFS should devise a minimum set of standards, which should be implemented by all provincial food authorities across the board for packaged milk produced in Pakistan.
- Large corporations, such as Olpers, which are exporting milk to Saudi Arabia, should be given tax incentives and encouraged to export to countries like China, where there is massive demand, and where the gravity theory supports it.
- The provincial livestock departments must establish at least one disease-free zone in the country that is globally certified and accepted.
- A safe milk policy should be introduced and implemented in KP to ensure that most of the milk enters the formal milk value chain, enabling value addition.
- The tax exemptions and incentives available to agriculture should also be extended to the livestock sector, as it is the biggest contributor to the agriculture sector. This must be rectified immediately.

Policy Grid Summary

Sr. No.	Policy Area	Action Areas	Policy Grid		
			Short Term (1-3 Years)	Medium Term (3-5 Years)	Long Term (5-10 Years)
1	Dairy Sector: Development on modern lines	Farm mechanization for efficient dairy farming		✓	
		Introduction of the gene pool through crossbreeding			✓
		Milk price de-capping/grading and standardization-based milk price adjustment	✓		
2	Meat Sector: Enhanced meat production and export surplus	Small farmer-centric meat production policy interventions		✓	
		Business-friendly environment through a regulatory framework		✓	
		Development of meat grading standards	✓		
		R&D-based facilitation for entrepreneurship		✓	
3	Poultry Sector: Availability of cheaper and healthy protein	Poultry breeds development by introducing better strains			✓
		Awareness campaign regarding poultry sector development	✓		
		Propagation of backyard poultry at a commercial scale		✓	
4	Nutrition: Improvement in the provision of secured, safe, and balanced nutrition	Propagation of multi-cut, high yielding with better nutritive quality of fodder varieties' seeds		✓	
		Strengthening of livestock nutrition & forage research facilities			✓
		Establishment of area-specific laboratories for nutritional analysis		✓	
5	Breed Improvement: Enhancing Animal Productivity	Selection and evaluation of indigenous genetically superior male animals through the Progeny Testing Program (PTP)			✓
		Restructuring of existing PTPs		✓	
		Development and incorporation of modern reproductive biotechnological interventions			✓
		Development of breeding policy for small ruminants	✓		
6	Disease Prevention and Control:	Prioritization of preventive regime	✓		
		Establishment of Centre for Zoonotic & Emerging Pathogens under One Health		✓	

	Reducing disease burden	Establishment of Disease-Free Zones			✓
		Establishment of a sub-office for Drug Regulatory Authority of Pakistan in Punjab for veterinary drugs		✓	
		Establishment of Punjab Animal Quarantine Directorate		✓	
7	Livestock Extension Services: Advisory services for increasing farming efficiency	Developing trained human resources for livestock extension services	✓		
		Development of e-Extension platforms		✓	
		Establishing collaboration for modern livestock extension models showcasing		✓	
	Investment and Marketing: Improving livestock economics	Grading/ standardization of livestock products	✓		
		Efforts for further increase in import duties on dry milk and whey powder	✓		
		Policy support for the development of the value supply chain of dairy, meat, and poultry by-products			✓
		Credit facilitation to small livestock farmers		✓	
	Regulatory Regime: Strengthening the legislative framework	Matching resource allocation for implementation of the legal framework	✓		
		Harmonization of legislation under the purview of different departments		✓	
		Facilitation for ease of doing business by simplifying the legislation	✓		
	Cross-Cutting Issues: Improving manpower, ICT-based systems, R&D resources; and focusing on protecting climate change and animal welfare	Development of strategy & modules for induction, in-service & promotion linked training for all staff	✓		
		Development of ICT based tool for intelligent decision making	✓		
		Introduction of Animal tracking system	✓		
		Prioritization of Water Conservation		✓	
		Planning of every activity, research, ADP in alignment with climate change	✓		
		Gender equality and mainstreaming at all levels	✓		
		Provision of equal opportunities related to hiring, training, and promotions	✓		
		Formation of R&D Advisory Board	✓		
		Prioritization of research areas based on outputs of ICT-based system	✓		
		Awareness of the public and farmers regarding animal rights	✓		

Note: As already indicated in chapter No. XII, the policy shall be subjected to periodical review for assessment of achievements of the targets as per the timeline given above and for further changes if required.

Logical Framework Matrix

Overall objective	**Logic**	**Indicators**	**Means of verification**	**Risks/ Assumptions**
Specific Objective	Improved quality and quantity of milk in Pakistan	Increase in milk production, consumption and export	Livestock Census PBS PLSM ESP TDAP MOC figures FAO	Continuity of policies, no major disease outbreak
Outputs and Outcomes	Enhanced productivity and higher yield per animal	Increase in farmers' incomes and milk supply	Baseline surveys of livestock in all provinces by departments	Continuity of zero-rated status for the dairy sector
Activities	Whole dairy value and supply chain optimization	Increase in cooperative and corporate farms	National Vaccination campaign figures	No major calamity like floods 2022
Inputs	Genetic improvement Improve breed quality	Performance agreements by livestock departments	Monitoring of KPIs and DLIs	Tenure security for the DG and Secretary Livestock

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