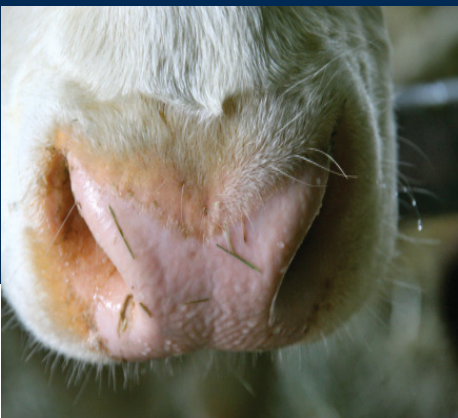


ENHANCING DAIRY SECTOR EXPORT COMPETITIVENESS

TRADE RELATED TECHNICAL ASSISTANCE PROGRAMME



THE TRTA II PROGRAMME IS FUNDED BY
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ENHANCING DAIRY SECTOR
EXPORT COMPETITIVENESS



The study was commissioned under Component 1 of the European Union (EU) funded Trade Related Technical Assistance (TRTA-II) programme. The TRTA II programme is implemented by the United Nations Industrial Development Organization (UNIDO) in collaboration with the International Trade Centre (ITC) and World Intellectual Property Organization (WIPO). The Component 1 is about trade policy capacity building and is implemented by the International Trade Centre (ITC).

ACKNOWLEDGEMENTS

This study was carried out as part of the Trade Policy Capacity Building Component, implemented by the International Trade Centre (ITC), of the European Union Trade Related Technical Assistance (TRTA II) Programme, which aims at strengthening the capacity of Pakistan to participate in international trade.

Nauman Aslam, Director, Trade Development Authority of Pakistan, wrote this paper. He is entirely responsible for the views expressed in the study. Ms. Asmma Kamal, Assistant Director, Trade Development Authority of Pakistan, assisted the author in completing this study and Mr. Raheel Rao and Mr. Mustansar Mehmood assisted in gathering statistics and carrying out field visits. Alan Matthews, Professor Emeritus of European Agricultural Policy, Trinity College, peer reviewed this study. The study was conducted under the direct guidance of Mohammad Owais Khan, Programme Officer, Trade Policy, ITC, TRTA II, Islamabad, together with Andrew Huelin, Consultant, Business and Trade Policy, ITC. Jean-Sébastien Roure, Senior Officer, Business and Trade Policy, ITC, was the overall supervisor.

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Finally, we thank PITAD for their overall support as well as active involvement in a public private consultative process, for which the findings of this study informed.

PREFACE

The development of the dairy sector and its vertical integration to produce value added internationally compliant products is important to enhance trade opportunities for Pakistan in the global market place.

Pakistan, being an agrarian economy and blessed with most appropriate weather and soil conditions is ranked 4th amongst the milk producing countries of the world. With approximately 35 million cattle and 32 million buffalos making up almost 55.1% of the agriculture value added and contributing up to 11.6% of the GDP, the future high growth in agriculture is expected to be led by the livestock sector. These animals produce 47.95 million tons of milk besides producing other products such as hair, skins, furs and meat. The major milk producing livestock categories are cows, buffalos and sheep.

Despite the fact that Pakistan's ranking is one of the highest in the region and world, the country has not been able to make efficient use of this resource to export dairy products in the world market. Some of the main reasons are efficiency losses in production, lack of awareness in farmers' and producers' communities of increasing milk yield, limited integration in the dairy value and supply chain, policy issues and resource constraints to implement initiatives on a wider scale.

This study attempts to highlight supply and trade related issues in the dairy sector that hinder its overall growth. An assessment of Pakistan's regulatory structure is conducted in consultation with the stakeholders in the public and private sectors to evaluate the performance of the sector, applicability and relevance of the existing policies to foster growth, and obtain policy options that can be recommended to the Government of Pakistan for inclusion in its future agenda.

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ACRONYMS

GDP	Gross Domestic Product
UHT	Ultra High Temperature
KPK	Khyber Pakhtunkhwa
SMEDA	Small and Medium Enterprises Development Authority
HF	Holstein Friesian
Swl	Sahiwal Cattle
AI	Artificial Insemination
SPU	Semin Production Unit
LDDD	Livestock and Dairy Development Department
PDA	Pakistan Dairy Association
LBDFFA	Livestock Breeders and Dairy Farmers Association
LFBA	Livestock Farmers and Breeders Association
FAP	Farmers Association of Pakistan
VMC	Village Milk Collectors
FMD	Foot Mouth Disease
HS	Hemorrhagic Septicemia
PPR	Peste des Petits Ruminants
FAO	Food and Agriculture Organization
PLDDD	Punjab Livestock and Dairy Development Department
SME	Small and Medium Enterprises
TPC	Total Plate Count
EU	European Union
GCC	Gulf Cooperation Council
HS Code	Harmonized System Code
MFN	Most-Favoured Nation
SPS	Sanitary and Phyto-Sanitary
TBT	Technical Barriers to Trade
REGS	Rapid Exported Growth Strategy
WTO	World Trade Organization
PDDC	Pakistan Dairy Development Company
LDDDB	Livestock and Dairy Development Board
NAPHIS	National Animal and Plant Health Inspection Services
MINFAL	Ministry of Food Agriculture and Livestock
MoIP	Ministry of Industries and Production
UVAS	University of Veterinary and Animal Sciences
PSQCA	Pakistan Standards and Quality Control Authority
ISO	International Organization for Standardization
PPQ	Plant Protection and Quarantine
PCSIR	Pakistan Council of Scientific and Industrial Research
NIH	National Institute of Health

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PARC	Pakistan Agriculture Research Council
PCRWR	Pakistan Council for Research in Water Resources
PFA	Punjab Food Authority
PFL	Pure Food Laws
FDA	Food and Drug Administration
CAC	Codex Alimentarius Commission
WHO	World Health Organization
RASFF	EU Rapid Alert System for Food and Feed
AVA	Agri-Food and Veterinary Authority of Singapore
FEHD	Food and Environmental Hygiene Department
BFAD	Bureau for Food and Drugs
LTO	License to Operate
MoPH	Ministry of Public Health
NAFDAC	Nigerian Agency for Food and Drug Administration Control
GSO	Gulf Standards Organization
UCL	Unified Customs Laws
UAE	United Arab Emirates
IEE	Initial Environmental Examination
EIA	Environmental Impact Assessment
PDBP	Pakistan Domestic Biogas Program
EPA	Environment Protection Agency
TS	Total Solids
ROI	Return on Investment
LUMS	Lahore University of Management and Sciences
CEDSEB	Centre of Excellence for Development of Sahiwal and Exotic Breeds
PLDDB	Punjab Livestock and Dairy Development Board
DRAP	Drugs Regulating Authority of Pakistan
TMR	Total Mixed Ration
STPF	Strategic Trade Policy Framework
TDAP	Trade Development Authority of Pakistan
PSDP	Public Sector Development Project
UNIDO	United Nation Industrial Development Organization
BBCF	Belgium Blue Cattle Farmers
RSPP	Rural Services Provider Program
PAMCO	Punjab Agriculture and Meat Company
CDGL	City District Government Lahore
PDA	Pakistan Dairy Association
PFO	Pure Food Ordinance
GAP	Good Agricultural Practices

EXECUTIVE SUMMARY

Despite being one of the largest milk producers in the world, Pakistan has been unable to efficiently utilize its large supply base to fully cater to its domestic demand. The dairy sector plays a crucial role in the social and economic uplift for a majority of the population engaged in the agriculture sector of Pakistan. The sector has a huge potential to alleviate poverty and to provide a source of livelihood and financial insurance for small farmers against crop failures and climatic changes.

However, the major hindrance to its development arises from the fact that the sector is largely informal and it consists of farmers raising very small number of animals, located in geographically dispersed and often remote areas. The above constraint is further complicated when other factors are considered, such as the lack of awareness in farmer communities regarding modern farming practices, efficiency losses leading to lower productivity per capita, limited outreach of governmental resources and development initiatives, lack of integration between dairy value chain and supply chain and weak farm to market linkages.

On the international marketing front for Pakistani milk and dairy products, the country needs to urgently overcome the quality and safety aspects as per the international standards and regulations to tap into potential export markets which have strict import regulations to overcome the two issues. A revamping of the current domestic regulatory framework is required in terms of food safety and quality, pricing and taxation regime, investment and the environmental impact of dairy farming. Unless the above are ensured, it is highly unlikely that Pakistan can enhance competitiveness of its dairy products in export markets other than Afghanistan at the moment.

The study concludes that to enhance the competitiveness of the Pakistani dairy products in the potential export markets, it is imperative to take a developmental approach to enhancing domestic productivity and quality. It is foreseen that the sector can only be developed through clustering of the large majority of small holder, dairy farmers on a 'One Farm Concept' which has met with much success in countries such as India. The same can be achieved through the creation of 'Dairy Hubs' that would ensure a direct and accountable provision of livestock development services by the public sector, along with a purchase mechanism established by the private sector based upon a consistent supply of quality milk for processing and further value addition.

The report also recognizes the need to encourage dairy farmers to adopt better dairy farming techniques and to increase their awareness regarding animal welfare and quality control which may result in better economic gains for them.

SECTION 1: DAIRY SECTOR OF PAKISTAN



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Introduction

Livestock breeding has remained a hallmark of the South Asian society since ancient times. Historically, the livestock sector has remained a subsistent sector where small holders have been raising animals for acquiring meat and milk products mainly for their own consumption and also to receive cash income through small-scale domestic selling. Usually, milk has been considered as the main product of livestock by the urban and rural community as compared to meat from the animals and therefore the animals are generally raised for obtaining milk production and making other dairy products there from. However this context has lately been changed and now farm animals are also raised on subsistent and commercial scales to sell them for obtaining meat and related products.

Pakistan is blessed with a large population of livestock that is well adapted to the local environmental conditions. Livestock is an important sector of Pakistan's agricultural mix and holds significant value in the rural socioeconomic system. More than eight million small and landless rural-based farmers raise livestock; therefore, making it an ideal sector for alleviating poverty in the country especially in the rural areas¹. Furthermore, since livestock makes up almost 55.1% of the agriculture value added and contributes up to 11.6% of the GDP², the future high growth in agriculture is expected to be mainly led by this sector.

Milk is the major commodity produced by the dairy sector. Its demand is increasing by an annual average of 20% (Afzal, 2008) in the organized dairy industry which requires milk production and supply to keep pace with the growing demand of the population through maintaining efficient supplies. However, since more than 83% of milk animals in the national herd are raised and bred by subsistent farmers who have limited interest in increasing productivity and have limited outreach to the support institutions in the public and private sector, the overall goal of achieving higher productivity in milk production seems to be a daunting task for the policy makers.

Other dairy products extracted from milk are also necessary to fulfil nutritional requirements of the population. These include butter, cheese, ghee, yogurt, khoya, and flavoured milk made through the use of traditional as well as modern methods. Traditional methods are mostly employed by the farmers to fulfil their subsistent needs. They also sell these products to support their household income. In the organized sector, these products are produced and packed through use of industrial processes and are sold on commercial scales to the consumers located in various parts of the country. These dairy manufacturers are located mainly in the province of Punjab and have efficient distribution networks across the country. However, there is a large dependence on imported products in the dairy sector due to the fact that the quantity, quality and variety of locally produced milk and dairy products do not fully cater to the needs of masses. The imported milk, mostly in powder form, is also used as an ingredient by many milk processing plants and other producers to produce UHT³ milk. Besides, imports are used as a balancing tool to bridge domestic demand and supply gap in milk and milk related products. The powdered milk is imported from the United States of America, New Zealand, France, Turkey, Singapore, Australia and some other countries⁴. In 2011, Pakistan imported powder milk worth US\$ 89.12 million from its partner countries mentioned above⁵.

Pakistan is also exporting milk in powdered form, but it is mainly to Afghanistan which is facing issues of food security and shortage due to on-going war on terrorism⁶. This powder milk is imported by some large producers who re-export it to Afghanistan to earn higher profits. Exports of powder milk from Pakistan amounted to US\$ 1.82 million to the world in 2011 out of which milk worth US\$ 1.77 million was exported to Afghanistan.⁷ Export of fresh milk from Pakistan is also high particularly to Afghanistan again due to the same reasons and by the large producers. Pakistan exported fresh milk worth US\$ 37.88 million in 2011 with 99% being exported to Afghanistan. It is pertinent to mention that exporting to Afghanistan is need based and does not involve Pakistan's own competence to export fresh milk to the world as the country,

¹ Livestock and Dairy Development Board of Pakistan

² Economic Survey of Pakistan 2011-12, Chapter 2, Agriculture (Islamabad: Official Printer, 2011), 29

³ Ultra High Temperature: milk that has been heated to a very high temperature so that it stays fresh for longer. Usually it can stay fresh in a tetra package for more than two months unless the pack is opened.

⁴ Other countries include Belgium, Germany, Netherlands, UK, Poland, Ireland, India etc.

⁵ ITC Calculations based on UN COMTRADE Statistics.

⁶ Big companies in the milk production and processing and some other milk dealers are mainly exporting imported dry milk to Afghanistan to get profits from the price differential between Pakistan and Afghanistan.

⁷ ITC Calculations based on UN COMTRADE Statistics

despite being one of the largest producers of milk in the world, still has issues relating to productivity, hygiene and standardization and ability to produce value added dairy products that can be exported on larger scales.

The dairy sector of Pakistan is a mix of producers including small, medium and large farmers with varying land and animal holdings and having different productivity levels. These consist of:

- i. Subsistent landless farmers having less than five animals with low productivity and limited access to high nutritional feed and health facilities;
- ii. Medium and large size farmers especially those located in the city and peri-urban areas having relatively higher access to these facilities. These farmers have access to better health facilities for their animals, appropriate and high yield producing nutritional feed, and better market access through more structured value chain, and
- iii. Dairy processing companies located near the peri-urban farms and milk producers and having strong supply chain and producing value added products.

In the rural areas, the large presence of dodhis (milkmen) in the supply chain links up the consumers and farmers supply of fresh milk and other dairy products like ghee, khoya, and yoghurt etc. Dodhis are also a source of supplying milk to the organized and semi-organized dairy producers located in the peri-urban and city centres. However, the variation in the quality of milk and loss of milk during transportation reduces the quantity of high quality milk required by the dairy producers and also increases cost to the consumers in general.

The dairy sector of Pakistan, despite its economic importance, suffers from debilitating supply constraints, market distortions and distribution inefficiencies. Other limitations include:

- i. Limited outreach of public sector initiatives to distantly located farmers;
- ii. Sustainability issues with projects undertaken in the public sector;
- iii. Conventional methods of raising animals and poor farm management, and;
- iv. Limited awareness of productivity, hygiene and breeding practices in the farmers' community.

These issues and their inappropriate handling have made it a difficult to achieve desirable growth and set out export targets unless some drastic policy measures are taken to foster growth in the dairy and livestock sectors.

In view of the fact that other businesses are facing competitiveness issues with tight profit margins, the dairy sector still offers greater opportunities to the investors and market players to undertake farming projects and earn high returns on their investments. Plentiful opportunities are available in the farming business and ancillary industry to integrate and produce high value added products that can not only cater to domestic demand of a large customer base but may also provide openings for exporting them to the international markets where food security is a rising concern.

The forthcoming sections of the study analyse the issues in the dairy sector's development and growth viz-a-viz government's policies and initiatives. These sections would further underline the impediments that hinder execution of the government policies and initiatives. An assessment of trade potential of dairy products originating from Pakistan is also made followed by required policy measures that are important to ensure growth and development in the dairy sector.

Geographical Spread of Major Livestock

Pakistan is located in the resource rich continent of Asia, with total area of 796,095 sq. km divided into 770,875 sq. km of land and 25,220 sq. km of water⁸. It shares borders with India on the east, China in the north and Iran and Afghanistan in the west. The country is geographically divided into five provinces namely Punjab, Sindh, Baluchistan, Khyber Pakhtunkhwa (KPK), and Gilgit Baltistan. The size of the population is over 190 million with an annual growth rate of 1.55%⁹. In terms of area, Baluchistan is the largest amongst all provinces whereas Punjab is the largest province in terms of population. Over 64% of the inhabitants live in the rural areas and are mainly involved in agricultural activities that also include raising animals for domestic and commercial purpose. The farmers are connected with markets for supply of dairy and livestock through organized and unorganized market mechanism.

Table 1 shows the geographical spread of different types of livestock on the basis of censuses conducted during various periods in the last five decades. It also provides a detailed account of animals located in various provinces of Pakistan. It further reflects that only in Punjab, approximately 57% of livestock [mainly in two categories, i.e. cows (48%) and buffalos (65%)] is raised. The second largest province that raises the two categories of livestock is Sindh with 25% share [cows (23%), buffalos (27%)]. Baluchistan, KPK (Khyber Pakhtunkhwa) and Gilgit Baltistan provinces share the rest.

Milk is also obtained from sheep, goats, and camels but is mainly used by farmers to meet their household needs. Therefore while assessing milk potential and supply chain, primarily these categories have not been taken into account.

Table 1: Province-wise Allocation of Livestock

(000'heads)

Province/Category	1960	1972	1976	1986	1996	2006
PAKISTAN						
Cow/Cattle	16,624	14,674	14,855	17,541	20,424	29,559
Buffalo	8,161	9,751	10,611	15,705	20,272	27,335
Sheep	12,378	13,667	18,937	22,655	23,544	26,488
Goat	10,046	15,581	21,693	28,647	41,166	53,787
Camels	490	731	789	958	816	921
Others	1,821	2,347	2,657	3,455	4,025	4,768
PUNJAB						
Cow/Cattle	9,673	8,226	8,108	8,817	9,382	14,412
Buffalo	6,129	7,413	7,979	11,150	13,101	17,747
Sheep	5,583	6,280	8,037	6,686	6,142	6,362
Goat	2,973	5,943	7,767	10,755	15,301	19,831
Camels	266	365	338	321	187	199
Others	1,146	1,347	1,454	1,938	2,186	2,458
SINDH						
Cow/Cattle	2,936	2,800	2,854	3,874	5,464	6,925
Buffalo	1,353	1,522	1,834	3,220	5,615	7,340
Sheep	1,590	840	1,829	2,616	3,710	3,959
Goat	2,201	2,275	4,237	6,755	9,734	12,572

⁸ CIA World Fact Book, Geography, <https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html>

⁹ CIA World Fact Book, People and Society, <https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html>

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Camels	62	80	144	218	225	278
Others	261	393	611	794	769	1,069
KPK						
Cow/Cattle	3,206	2,962	3,000	3,285	4,237	5,968
Buffalo	651	791	762	1,271	1,395	1,928
Sheep	2,432	2,455	3,675	1,599	2,821	3,363
Goat	5,035	3,737	4,686	2,899	6,764	9,599
Camels	76	101	95	70	65	64
Others	348	471	438	503	641	703
BALUCHISTAN						
Cow/Cattle	643	482	684	1,157	1,341	2,254
Buffalo	26	22	33	63	161	320
Sheep	2,564	3,859	5,075	11,111	10,841	12,804
Goat	1,596	3,238	4,441	7,299	9,369	11,785
Camels	86	185	212	349	339	380
Others	109	191	268	403	432	538
NORTHERN AREAS*						
Cow/Cattle	236	204	209	408	N/A	N/A
Buffalo	2	3	3	1	N/A	N/A
Sheep	208	233	321	643	N/A	N/A
Goat	241	388	562	939	N/A	N/A
Camels	N/A	N/A	N/A	N/A	N/A	N/A
Others	18	23	27	30	N/A	N/A

Source: 1) Economic Survey of Pakistan 2011-12 (Table 120)

2) Livestock Census 2006

Note: 1. Other livestock includes horses, asses, mules (excluding poultry)

2. *Northern Areas are now called Gilgit Baltistan Province.

Statistical Analysis of Supply Side

Herd Population

Total herd population consists of 36.9 million cattle (average growth of over 3% per annum), 32.7 million buffalos (average growth of 3.6% per annum), 28.4 million sheep and 63.1 million goats (with annual growth of approximately 2.6%) besides one million camels and 5.4 million horses, asses and mules¹⁰. For those cows over three years 10.5 million are in the milk production and 5.3 million are in dairy production. Buffalos have approximately the same figures in milk and dairy production¹¹.

¹⁰ Economic Survey of Pakistan 2011-12 and based on inter census growth rate of livestock census 1996 and 2006.

¹¹ Ministry of Food Security and Research, Government of Pakistan.

Table 2: Livestock Population

(Million heads)

Species	2009-10	2010-11	(Change %)	2011-12	(Change %)
Cattle	34.3	35.6	3.79%	36.9	3.65%
Buffalo	30.8	31.7	2.92%	32.7	3.58%
Sheep	27.8	28.1	1.08%	28.4	1.06%
Goat	59.9	61.5	2.67%	63.1	2.60%
Camels	1.0	1.0	0%	1.0	0%
Horses	0.4	0.4	0%	0.4	0%
Asses	4.6	4.7	2.17%	4.8	2.17%
Mules	0.2	0.2	0%	0.2	0%

(Figures are estimated based on inter census growth rate of Livestock Census 1996 and 2006)

Source: 1) Economic Survey of Pakistan 2011-12

2) Ministry of National Food Security

The herd population data in the selected categories is provided in Table 2. The data is calculated on the basis of the last census conducted in the year 2006 taking an average growth rate in each category based on historical trends.¹²

These animals produce 47.95 million tons of milk besides producing other products such as hair, skins, furs and meat¹³. Major milk producing livestock categories are cows and buffalos besides sheep. The consumption of milk accounts for 38.69 million tons as against the above mentioned production figure. The gap is due to the 20% loss in supply of milk, resulting from wastage in transportation and calving.¹⁴

Milk Production and Consumption

The marketable milk is mainly obtained from cows and buffalos and is distributed to the consumers through the use of various conventional as well as modern marketing channels¹⁵. It accounts for 96% of total milk produced from cows, buffalos, sheep and camels (see Table 3).

The milk of sheep, goat and camels is mainly used for household consumption by the farmers or small households, particularly in the rural areas of Pakistan. The break-up of milk production is given at Table 3 while the consumption has been reported in the Table 4.

Table 3: Milk Production

(000' tons)

Species	2009-10	2010-11	(Change %)	2011-12	(Change %)
Milk (Gross Production)					
Gross Production	44,978	46,440	3.25%	47,951	3.25%
Cow	15,546	16,133	3.78%	16,741	3.77%
Buffalo	27,848	28,694	3.04%	29,565	3.04%
Sheep*	36	36	0%	37	0.28%
Goat	739	759	2.71%	779	2.64%

¹² The figures reported in the tables reflecting herd population are calculated by the authors of Economic Survey of Pakistan 2011-12 on the basis of average yearly increase keeping historical trends in focus. Therefore, the real data as of today might differ from the above determined data but not substantially.

¹³ Ministry of Food Security and Research, Government of Pakistan.

¹⁴ Approximately 15% is wasted in transportation and 5% in calving (In Pakistan, milk lost during calving is also treated as wastage).

¹⁵ Conventional channels are through dodhis (milkmen) while others include more organized and sophisticated distribution channels involving distribution networks of milk processing companies and milk shops in the urban centres.

ENHANCING DAIRY SECTOR EXPORT COMPETITIVENESS IN PAKISTAN

Camels*	808	818	1.24%	829	1.34%
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Source: Economic Survey of Pakistan 2011-12

Ministry of National Food Security

(Figures are estimated based on inter census growth rate of Livestock Census 1996 and 2006)¹⁶⁾

Very recently, there has been a rise in milk production from imported and mix bred cows with high yield which fetch more value¹⁷. These cows are raised in more structured and organized farms located near the urban metropolis. Much of the production from these centres is purchased by large milk producing plants for commercial sales after processing and packaging. This trend has become popular with the passage of time and now cows from Denmark and Sweden are also being imported besides imports of cows from Australia which were found less compatible with local feed and possess lesser yield than the other imported breeds (Danish and Swedish).

Table 4: Milk Consumption

(000' tons)

Species	2009-10	2010-11	(Change %)	2011-12	(Change %)
Milk (Human Consumption)					
Gross Consumption	36,299	37,475	3.24%	38,690	3.24%
Cow	12,437	12,906	3.77%	13,393	3.77%
Buffalo	22,279	22,955	3.03%	23,652	3.04%
Sheep*	36	36	0%	37	0.28%
Goat	739	759	2.71%	779	2.64%
Camels*	808	818	1.24%	829	1.34%

Source: Economic Survey of Pakistan 2011-12 Ministry of National Food Security

(i) Figures are estimated based on inter census growth rate of Livestock Census 1996 and 2006.

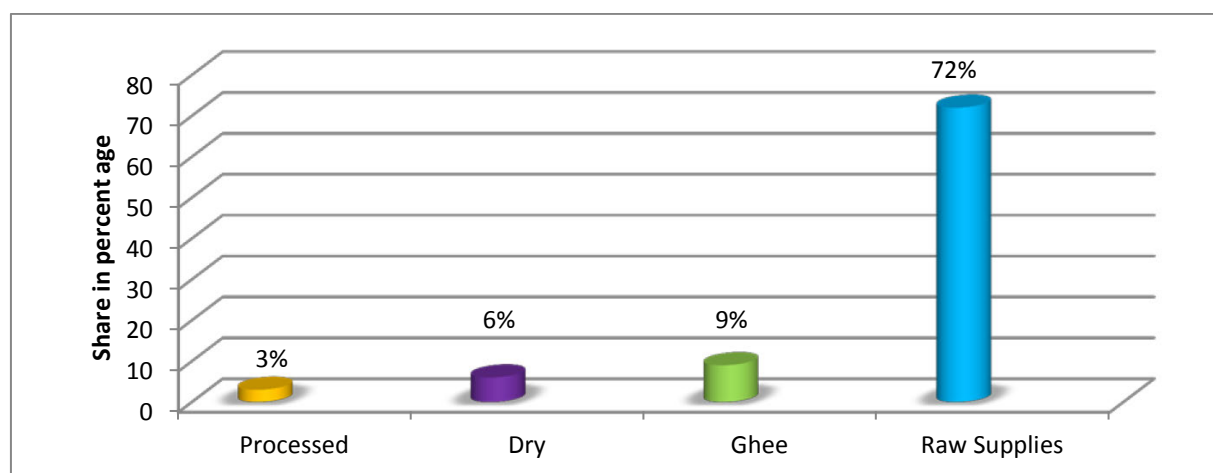
(ii) Milk for human consumption is derived by subtracting 20% (15% wastage in transportation and 5% in calving) of the gross milk production of cows and Buffalo.

It is pertinent to mention that the milk consumption is shared by the urban and rural population with the former having a consumption share of approximately 29% and the rest goes to the rural population. Only 3% of the total milk production is processed and marketed through the formal channels¹⁸ whereas the rest, which is mainly produced in the rural economy, is not appropriately linked to the market mechanism owing to various reasons. Due to these factors and considering its huge potential, apart from meeting consumption requirements of small households and subsistent farmers, the rural-based dairy sector is not making a significant impact on the national economy.

¹⁶The figures are based on available national statistics through the federal ministry of National Food Security and Research. However, during the course of preparing this study it was observed that a discrepancy exists between the national and international dairy production and consumption data. Case in point is of the FAOSTAT figures on Pakistan's Milk Commodity Balances. It is recommended that the government of Pakistan may take up the issue of removal of this discrepancy with the agency.

¹⁷The fixed cost of maintaining these animals is reduced as quantity of milk obtained from one Swedish cow is almost three times more than an Australian animal of same species. They have more compatibility towards localized feed and with an additional expense of maintaining them in controlled environment they still end up giving handsome margins to the investors.

¹⁸The White Revolution, Doodh Darya (2006), Pakistan Dairy Development Company's Publication, p-7

Figure 1: Share of Processed and Raw Dairy Supplies in Domestic Market


Source: Author's calculations on the basis of data available with Small and Medium Enterprise Development Authority (SMEDA)

Imported Dairy Products

Domestic supplies of milk and other dairy products are insufficient to meet the home market's needs and therefore Pakistan imports dairy products from the world to bridge demand and supply gap. Some of the products that Pakistan imports include powdered milk (US\$ 24 m in 2009, US\$ 52 m in 2010, US\$ 89 m in 2011) from the United States, New Zealand, France, Denmark, Turkey and Singapore etc., cream powder (US\$ 17 m in 2009, US\$ 12 m in 2010, US\$ 6.9 m in 2011) from France, Ireland, New Zealand, and Malaysia etc., cheese and curd (US\$ 3.9 m in 2011) from New Zealand, Australia, Saudi Arabia and Denmark etc., milk cream (US\$ 1.36 m in 2011) from U.A.E, Malaysia, and Netherlands etc., and butter and other fats and oil derived from milk (US\$ 0.25 m in 2011) from Denmark, United States and Italy etc..

Table 5
Import of Major Dairy Products (Value/Quantity)

(Value in 000' US \$, Quantity in Tons)

Product	2007	2008	2009	2010	2011
Powder Milk (Value)	11,342	24,200	24,390	52,152	89,128
Quantity (tons)	5,604	6,882	8,192	17,731	27,706
<i>Unit cost/kg (US\$)</i>	<i>2.02</i>	<i>3.52</i>	<i>2.98</i>	<i>2.94</i>	<i>3.22</i>
Cream Powder	30,638	1,770	17,333	12,206	6,885
Quantity (tons)	10,741	711	7,017	4,049	2,224
<i>Unit cost/kg (US\$)</i>	<i>2.85</i>	<i>2.49</i>	<i>2.47</i>	<i>3.01</i>	<i>3.10</i>
Cheese and Curd	4,111	4,666	3,412	3,476	3,933
Quantity (tons)	1,355	1,485	1,103	1,117	1,215
<i>Unit cost/kg (US\$)</i>	<i>3.03</i>	<i>3.14</i>	<i>3.09</i>	<i>3.11</i>	<i>3.24</i>
Milk Cream	7,929	809	1,087	1,561	1,354
Quantity (tons)	3,407	511	656	862	801
<i>Unit cost/kg (US\$)</i>	<i>2.33</i>	<i>1.58</i>	<i>1.66</i>	<i>1.81</i>	<i>1.69</i>
Butter and other Fat and Oil	404	124	452	355	249
Quantity (tons)	208	67	168	101	89

Unit cost/kg (US\$)	1.94	1.85	2.69	3.51	2.80
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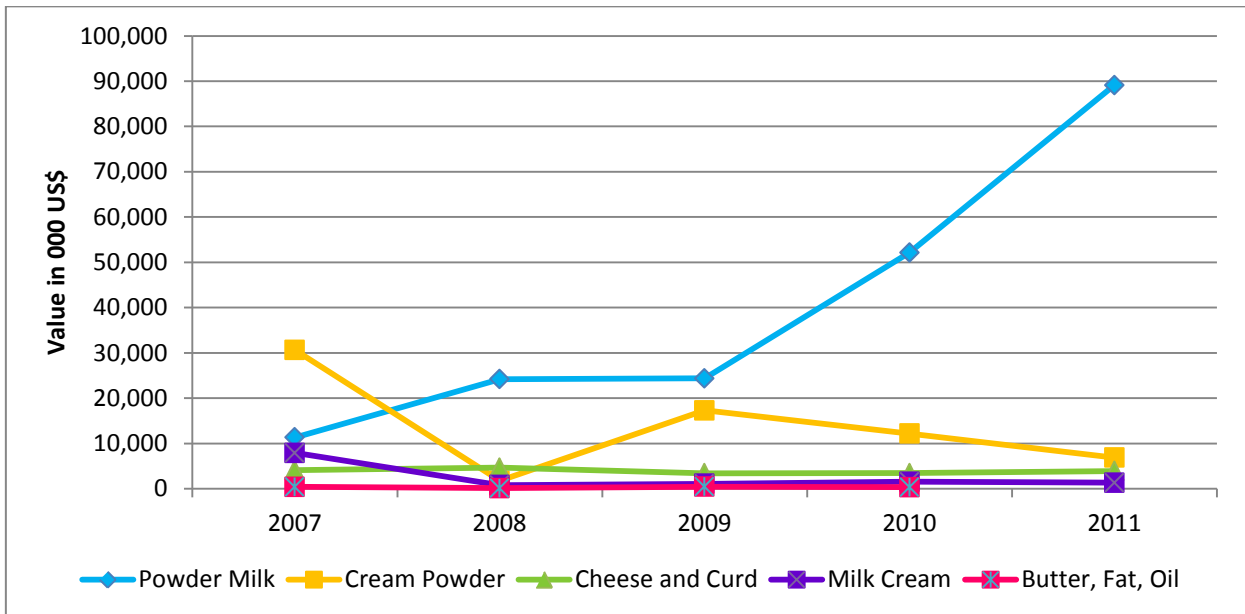
Source: Author's calculations based on UN COMTRADE statistics

The above statistics further provide an insight into the fact that much of domestic demand is not met from the domestic supplies in milk. This is either due to incapacity to fully cater to the domestic powder milk requirements or that the country does not specialize in production of instant powder milk including coffee mate and milk for infants which is a major part of the imported powder milk. There is one other reason and that is the high cost of establishing powder milk plants and their viability from a sustainability point of view. Instant milk is mostly required in the metropolis as it has created a large market share in these city centres where either the access of dodhis is limited or people consider powder milk as more hygienic and easy to use.

Further to the above, many milk producing business concerns require powder milk to produce UHT milk which is cost effective for the producers and also complements the taste for milk. The import of powder milk surged to US\$ 89.128 million (2011) from US\$ 24.39 million (2009) or by 265%, in only two years period. The rise is also reflected in the quantity wise sharp increase of 238 % in 2011 as compared to 2009, which was manifested by increase in quantity to 27,706 MT in 2011 from 8,192 MT in 2009. Another reason that was determined during the survey appears to be the fact that during the previous years, global milk prices were reduced due to excess supply and therefore powder milk was available at attractive prices. The local producers and dealers imported powder milk in sizeable quantities, as shown in above table, and built their stocks for use in production of UHT milk that resulted in a sharp rise in import volumes and value.

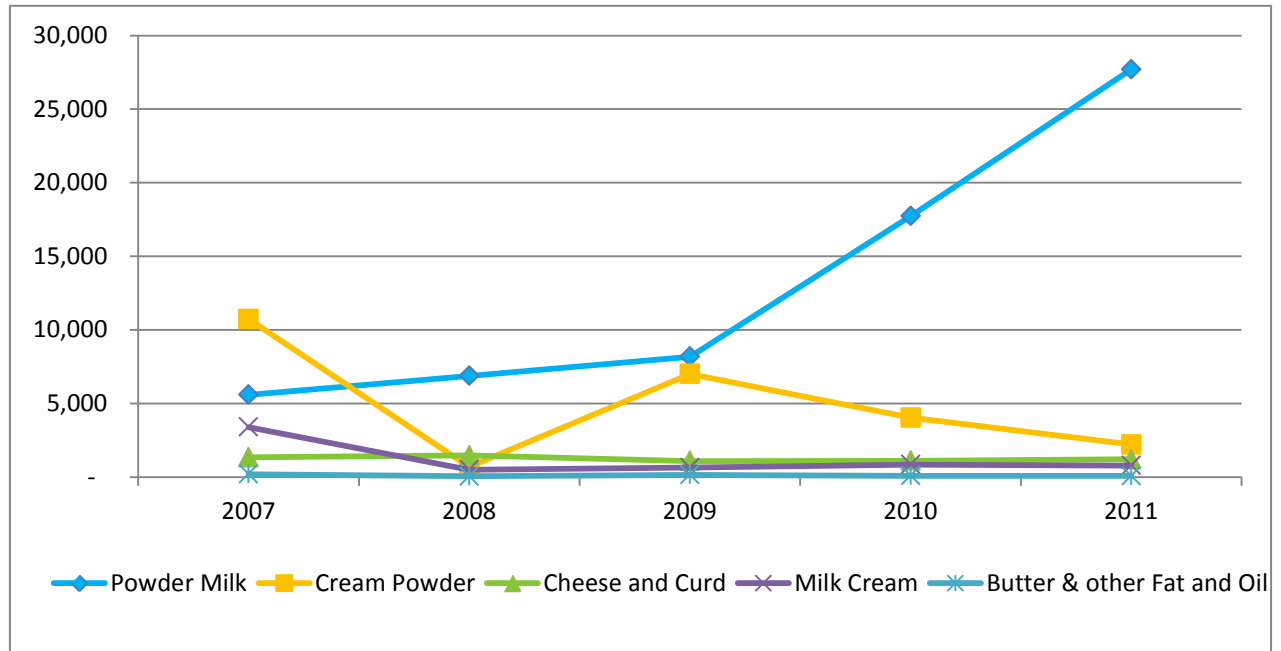
The trends also reflect that the gap would further widen due to increasing demand for milk and insufficient domestic supplies to meet the requirements of a growing population. In addition to this, other dairy value added products such as cream powder, cheese, milk cream and butter are imported though these could easily be prepared locally had the dairy industry been diversified to produce variety of value added products.

Figure 2: Import Trends of Major Dairy Products (Value)



Source: Author's calculations based on UN COMTRADE statistics

Figure 3: Import Trends of Major Dairy Products (Quantity)



Source: Author's calculations based on UN COMTRADE statistics

The above situation can be tackled if the dairy sector is enabled to generate surplus milk through efficient production system and with use of appropriate farming methods. These, coupled with policy initiatives and strong implementation system, would enable the value added dairy industry to produce a variety of dairy products which will cater to domestic requirements and produce surplus supplies for exports.

SECTION 2: THE DAIRY VALUE CHAIN AND SUPPLY SIDE CONSTRAINTS

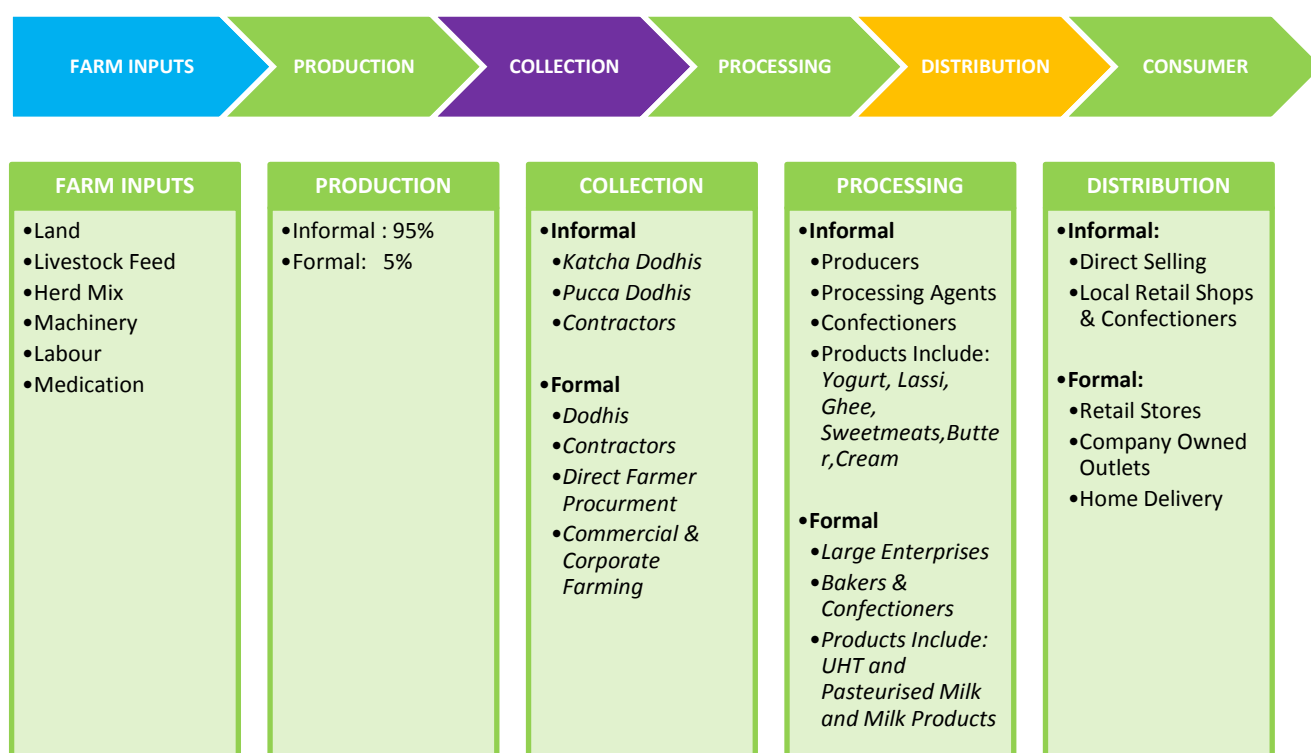


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Mapping the Dairy Value Chain

As mentioned in the preceding section, the dairy value chain is a set of organized and unorganized activities performed by various players in the dairy sector. Figure 4 below provides an account and understanding of how the dairy value chain works in the organized sector. It starts from farm inputs which are helpful in production of milk at various levels. Milk collection, processing and distribution are other functions performed by other individual or a set of players either under single ownership or as separate activities.

Figure 4: The Dairy Value Chain



Source: Above figure is produced on the basis of information collected from various stakeholders

The above figure is explained in detail below.

Inputs

Land

The dairy sector in Pakistan consists of three types of producers: (i) small farmers, (ii) medium-sized farmers/producers, and (iii) large-scale producers. This categorization is mainly done on the basis of *milch* animal (mainly cows and buffalos) holding capacity of these farmers and producers. About 80% of the farmers in Pakistan are categorized as small holders. They raise more than 50% of total *milch* animals. Their herd size is below five. The medium-sized farmers who make 14% of farm holders raise 29% of total *milch* animals in Pakistan with holding capacity of 5-10 animals. Lastly there are 3% large-scale producers sharing 21% of herd holding and raise more than 10 animals¹⁹.

¹⁹Dairy Development in Pakistan, Umm e Zia, T. Mahmood and M.R. Ali, Food and Agriculture Organization (FAO), 2011

The above three types of producers raise *milch* animals mainly on agricultural lands which is spread over an area of 263,000 sq. Km. Almost one-fifth of this land is being used as pasture land to raise livestock including *milch* animals²⁰. The small scale subsistent farmers mainly raise animals on lands which are not proper farmlands and lack many facilities such as access to fodder, grazing grass and availability water etc. Medium and large-scale producers are mostly located near the urban and peri-urban areas. They have relatively better access to the above stated facilities. Besides, due to their close proximity with the consumer markets, they enjoy a better supply chain and organized distribution system.

Nutritional Feed

The feed that is available for the livestock in Pakistan includes fodder (dry and green crops/roughage), concentrate feeds, silage and mineral mixtures. The animals require a balanced diet to keep good health and produce milk as per required yield levels. However, since a major portion of *milch* animals are bred by subsistent landless farmers, the nutritional requirements are not fully met. The main reasons are lower levels of awareness on feed requirements, disinterest on part of farmers to enhance milk yield and last but not least, the low economic conditions of the farmers who have limited access to proper feed. The feed provided to these animals includes fodder mainly grown in limited quantities by these farmers or procured from the local markets.

On the other hand, increase in overall demand for appropriate fodder has stimulated the growth of better crops such as *oats, berseem, lucerne, sorghum-sudangrass, mott grass, sorghum, maize and millet*. The popular types of dry roughage/ fodder include *wheat straw, rice straw, oats straw, maize-sorghum stubble, sugarcane bagasse, cottonweed hulls and corn cobs*²¹.

Concentrate feed ideally make up about one third of the animals' daily dietary intake along with two thirds of Crop *Silage*²². The concentrates include blends of various raw materials and additives that are made for specific dietary requirements (protein, energy, vitamins or minerals) of the animal. In Pakistan, mostly the *Silage*²³ is produced from corn crop whereas this can be prepared by using any crop which helps in increasing the productivity of *milch* animals. To reduce input costs for the farmers, the Government of Pakistan has introduced duty-free import of certain feed ingredients, growth promoters and vitamin premixes into the country²⁴.

Herd Mix

Amongst the common breeds, *Nili Ravi* and *Kundi* are the best *milch* buffalo breeds in Pakistan. *Nili Ravi* is mostly found in Punjab's districts of Lahore, Sheikhpura, Faisalabad, Sahiwal, Multan and Bahawalnagar. These black colour breeds have average weight of 800 kg at maturity for male and 525 kg for the female [SMEDA (2011)]. They have a wedge shape, massive frame, small curly horns, and wall eyes. They often have white markings on the forehead, face, muzzle and legs and white switch of tail (buffaloes with such markings highly desired and popularly called "Panj Kalian"). They have a large, strong udder and are generally docile²⁵.

The *Kundi* breed is mostly found in Sindh's districts of Dadu, Hyderabad, Karachi, Larkana, Nawabshah, Sanghar and Thatta located. They have solid black colour with an average weight at maturity for the male being 600 kgs and 375 kgs for the female. The purchase price of a buffalo in second lactation on average is Rs 90,000 [SMEDA (2011)].

Figure 5 contains list of local breeds in Pakistan raised and bred in various parts as explained above.

²⁰Food and Agriculture Organization (FAO) Statistics, 2009

²¹ SMEDA

²² Ibid

²³ Silage is a fermented fodder, containing high levels of moisture that can be fed to cud-chewing animals like cows, buffaloes, sheep etc. The fodder is made by cutting the green plants and storing then in a silo, making a huge heap and covering it in a plastic sheet or by wrapping large bales of the same in plastic film.

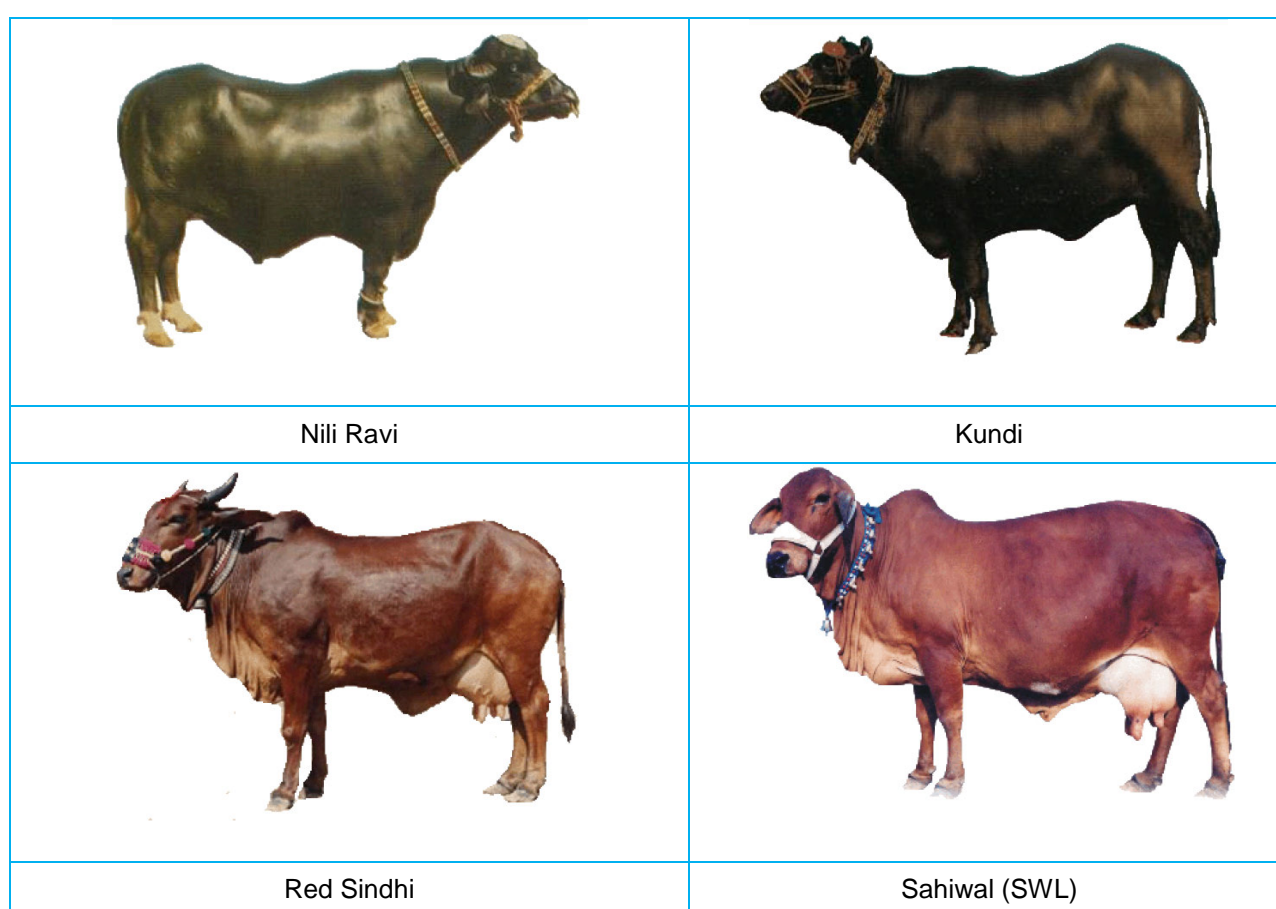
²⁴Economic Survey of Pakistan 2011-12, Chapter 2, Agriculture

²⁵ SMEDA

Figure 5: Important Cattle and Buffalo Breeds in Pakistan

Species	Milk purpose	Dual purpose	Draught purpose
Buffaloes	Nili Ravi		
	Kundi		
Cattle	Sahiwal (Swl)	Tharparkar	Bhagnari and Dajal (Heavy)
	Red Sindhi	Kankrej	Dhanni (Medium)
			Rojhan and Lohani (Light)
Cross bred Cattle	Swl x Holstein Friesian (HF)		
	Swl x Jersey		

Source: SMEDA



The price of an animal depends upon its physical condition, previous production and historical yield of its ancestors. In summers and monsoon season, the price of a buffalo is higher as compared to its lower value in winters, due to higher rate of fertility and better adaptability to hot and humid conditions than the cow. *Milch* animals in second or third lactation are preferred as the probability of increase in milk production is higher.

In crossbred cattle, crosses of *Sahiwal x Jersey* and *Sahiwal x Holstein Fresien* (HF) are preferred whereas in local breeds, *Sahiwal* cattle are considered to be suitable to start a dairy farm. *Sahiwal* (Swl) is one of the best dairy breeds in Pakistan. It is tick-resistant²⁶, heat-tolerant and is known for its high

²⁶Tick is a parasite that is found in the animal farms especially in the rain season. They infect the animals and mostly get fed on them.

resistance to internal and external parasites. These cows have much higher yield. Due to their heat-tolerance capability and high milk production, they are also exported to some of the Asian countries besides their exports to Africa and the Caribbean.

The *Red Sindhi* originates from the province of Sindh. However, due to its hardiness, heat resistance and high milk yields, it has found places in many other parts of the country. *Red Sindhi* is also compatible to hard environmental conditions and it is found in at least 33 countries of Asia, Africa and Americas. It has a basic deep rich red colour which may vary between yellowish brown to dark brown.

The *Tharparkar* breed is used for both for the milk production and draught power. These cows are found in the vicinity of Umarkot, Naukot, Dhoronaro, Chhor, Mithi, Islamkot, Khari Ghulam Shah and Kachh. The cows have an average weight of 408 kg.

The *Holstein* cow originated from Europe. The major historical development of this breed occurred in Netherland and more specifically in the two northern provinces of North Holland. *Holsteins* are distinctly recognized for their unique colour markings and outstanding milk production. *Holsteins* are large and stylish animals with colour patterns of black and white or red and white. *Holstein* heifers can be bred for 15 months till their body weight gets to approximately 325 kgs between the age of 24 and 27 months.

Australian Friesian Sahiwal breed is being developed in Australia by the Queensland Government for use in the tropical areas. The breed evolved after cross breeding the *Sahiwal* from Pakistan and *Holstein-Friesian* from Australia. This breed has now extensively been tested in the tropical and sub-tropical areas of Australia. This cow produces good quality milk with 3.4% proteins and 4% butter fat.

Farm Machinery

Due to their low economic conditions and high cost of technology, the small farmers mostly remain unable to adopt modern methods of milk production. Milking is done manually in containers that are not compatible with the hygiene requirements and are also not appropriate for longer storage. Any surplus quantity is immediately sold to *dodhis* for cash income.

The medium to large scale producers mostly with commercial interests often make use of farm machinery and equipment such as fodder choppers, milk utensils, water pumps, freezers for cold storage, and calf feeders etc. However, if compared to the international quality standards, most of this equipment utilized would not conform to the required standards. Therefore, in order to support the farmers, the government has allowed duty free import of livestock machinery and equipment.

Farm Labour

Small farmers primarily utilize their family members as the main source of labour for raising the livestock. In rural areas mainly the women are involved in managing feeding, watering, housing and cleaning of the animals. Men are usually involved in selling milk and dairy products besides seeking medical treatment for these animals from the available sources in case these fell sick.

Medium and large scale producers are more likely to employ farm workers and professionally qualified staff to look after the management of their farm and animals on the basis of the number of animal they keep and flexible income levels in contrast with the small farmers.

Medication

Vaccination and medication is required to prevent outbreak of disease in the animal herd. Each new animal is usually required to be vaccinated before entering the farm. The approximate cost of vaccination per animal is Rs 550 or US\$ 6 per animal per year. Mostly, these vaccines are provided by the local governments from government run veterinary hospitals against payment. Besides, these vaccines are also available under the prescribed schedule of vaccination from the vaccine institutes located in various parts of the provinces. The farmers are also provided these facilities through various field veterinary centres.

Artificial Insemination (AI) services are charged for Rs100 per animal for both cow and buffalo. There are four Semen Production Units (SPUs) in Punjab which are placed under the Directorate of Breed Improvement, Livestock and Dairy Development Department.²⁷

Milk Production

Out of the total milk production in Pakistan, approximately 80% is produced in the rural farmlands. These farmlands are geographically dispersed mainly in the far flung rural areas of the country. The production of milk is labour intensive and primarily involves manual methods of milking the animals. About 60% of the total milk production from rural farmlands is consumed at source while the remaining marketed through the distribution channel of *dodhis*²⁸. The subsistence small holders tend to produce other dairy products with longer shelf lives such as *Khoya* (condensed sweetened milk) and *Desi Ghee* (milk and cream fat used for cooking food).

Milk is also produced in the farmlands owned or operated by medium and large-scale farmers. They have relatively better value chain and they have better managed distribution system.

Milk Collection

Informal Channels

Approximately 95% of the total milk produced in Pakistan is collected and marketed through the informal channels. These channels are mainly dominated by the traditional milk collection agents called *dodhis*. These *dodhis* serve as a main source of procuring milk in Pakistan and have proven to be the most reliable link between the farmers and the consumers so far. On the basis of scale of operation, these *dodhis* can be divided in three categories including; (i) the *Small (Katcha) dodhis* performing door-to-door collection of up to 100 litres of milk each day, (ii) *medium-sized (Pucca) dodhis* are involved in daily milk collection and distribution of 400-800 litres, and (iii) *large dodhis (Contractors)* involved in milk collection mainly from the medium-sized *dodhis* with daily average collection and distribution of 40-70 maunds (one maund = 37.3242 litres).

Dodhis sell more than 80% of the milk collected to the contractors, 10% to the collection agents/procurers of the processing plants and about 5% to the local confectioners and bakers. On the other hand, the contractors sell 90% of the procured milk to milk retail shops, milk processing plants and to the large-size bakers and confectioners.²⁹

Formal Channels

As the quality of milk is the main yardstick for production of value added processed milk (in UHT or pasteurised form), the milk processing units, wherever convenient, prefer to have direct procurement channels. However, as the milk production is geographically dispersed, these companies have to rely on the conventional milk collection and distribution agents.

Large milk and dairy producing companies are now moving towards integration of dairy value chain. This experience has greatly ensured consistent supply of desired quality of milk that holds key importance in satisfying customer needs and increase in the market share. These companies have set out quality criteria and therefore the suppliers including *dodhis* and large milk collection contractors are made bound to confirm to these standards. This approach has enabled the contractors to adopt measures including use of refrigerated containers and farm cooling tanks which has mainly helped in appropriate storage and preservation of fresh milk.

²⁷ SMEDA

²⁸ FAO Statistics, 2003

²⁹ Dairy Development in Pakistan, Umm e Zia, T. Mahmood and M.R. Ali, Food and Agriculture Organization (FAO), 2011

Milk Processing

Informal Processing

Apart from milk which is largely demanded by the consumers all over the country, other products obtained from milk include yogurt, ghee, butter, khoya, milk cream, and flavoured milk. As evident from statistics presented in Section 1, only 3% of total milk production is used in the formal processing industry for production of dairy products while rest is used for drinking and as an ingredient in producing other dairy products in the informal sector.

The dairy products produced in the informal sector employ traditional techniques that do not bear high costs, as against more sophisticated processes used by the producers of value added dairy products and therefore are largely preferred by the general population due to ease of availability and lower prices. . It may however be noted that since these products are not produced in a standardized manner, they are generally low in hygiene and quality.

Formal Processing

Only 3% of total milk production is used in the formal processing industry for the production of dairy products. Milk is processed in UHT and pasteurized forms by these processing companies. With increasing awareness in the consumers that are mainly located in the urban and peri-urban centres, the demand for processed milk is continuously rising. This has created opportunity for the new entrants in milk processing and selling business.

In urban centres like Lahore, large sized bakers and confectioners such as *Nirala* and *Gourmet* are processing milk and other dairy products under their own brand names. For milk distribution and sales, these confectioners use their sales points that are spread all over the city. Their products also cater to the needs of adjoining markets where the milk sellers' purchase from these brands to place them on shelves of their sales centres and stores. Some of other large dairy producers that are more efficient in milk production and distribution include Al Tahur Farms, Dada Dairies and Sapphire Farms. Furthermore, they also have greater opportunities to enter into the meat production business by using their existing facilities and without involving much extra costs.

There are other brands like *Halla* and *Adams* that are selling their products to a large number of stores. They also incentivize local shops and stores by providing them refrigerators and deep freezers for milk storage which is also used as their marketing tool. Therefore, an overview of the formal processing industry indicates healthy trends in development of this formal dairy processing sector.

Formal Distribution

The primary results of the formal processing industry are the visually attractive, tetra-packaged, UHT and pasteurized milk and dairy products that are considered more hygienic and safe for use by the affording consumers. These products are stored in the company's warehouses and supplied to retail outlets throughout the country by employing an advanced and well managed distribution network.

Role of Producers' Organizations in the Dairy Chain

The dairy industry in Pakistan is characterized by limited production and fewer marketing organizations. The organizations currently operational are mostly in the private sector. They aim at ensuring consistent supply of milk for further processing. The following two models are being used for procurement of milk and processing in the formal sector:

- a) **Commercial Procurement Model:** This model is being followed by large enterprises such as Nestle and Engro Foods. However this lacks proper vertical integration in the dairy supply chain system. In this model, milk is collected using traditional milk collection agents called *dodhis* who act as intermediaries between the small farmers and the milk

processing enterprises. The model is characterized by the payment of relatively higher prices to the farmers to ensure the continued supply of milk.

- b) **Vertically-Integrated Cooperative Setup:** This model aims to ensure welfare of the farmers in terms of productivity and income. *Idara-e-Kissan (IK)* is the only dairy cooperative operational in Pakistan based on this model. The milk is procured from geographically dispersed small farmers through a network of village milk collectors who are also responsible for transportation of collected milk to the processing plants of *Hala Dairies*³⁰. The system is more focused on the provision of development-related livestock services such as veterinary care, animal vaccination, artificial insemination, feed improvement, extension and social services while it is less focussed on payment of high prices for milk to the farmers. Any village farmer can become a member of this organization if he/she owns at least one cow or buffalo. Although there is no membership fee, however, the farmer should be able to supply at least 300 litres of milk in a six-month time period to benefit from the development services offered by the cooperative setup for the next six months.

As can be observed, both models rely heavily on the village milk collection agents or *dodhis* for procurement of milk from farmers. The prices received by farmers are based on the weekly quotations for milk containing at least 6% fat by the processors. The quality of milk is tested by these agents and milk is then transported to the milk collection centres of the processing companies. These centres are equipped with the necessary chillers and other equipment that maintains temperature of milk at 2°C for the purpose of reducing the risk of contamination and spoilage. From this point, milk is transported to the processing plants through specialized storage trucks. The plants process the milk into UHT and pasteurized dairy products for supply to urban consumers. Although *Idara-e-Kissan* has been successful at organizing small farmers and vertically integrating its supply chain for processing of milk into dairy products by *Halla*, the impact of the project has been limited due to its incapacity of reaching a large number of farmers scattered in various parts of the country. According to estimates, the organization accounts for just 0.2 per cent of the total milk produced in Pakistan and only about 2 per cent of the total UHT/ Pasteurized milk in the country (Riaz, 2008). There is dire need to establish additional dairy cooperatives on the same lines of India (*Amul Dairy*) where the concept has gained popularity and organized geographically dispersed farmers effectively.

Some of the private sector trade organizations that aim to bring together dairy farmers of the country and address their production and marketing related constraints include the Pakistan Dairy Association (PDA), Livestock Breeders and Dairy Farmers Association (LBDFA), Livestock Farmers and Breeders Association (LFBA) and Farmers Association of Pakistan (FAP).

The Contract Dairy Model

Although the milk processing companies in the formal sector prefer to procure milk directly from the farmers, they are forced to rely on the milk collection agents or *dodhis* due to the limited outreach of their collection networks. The commercial processors enter into contracts with the rural *dodhis* or Village Milk Collectors (VMC) / contractors. In cases where the VMC centres have been set up by these companies, the village farmers can directly sell milk to these contractors who are available during morning and evening times.

The VMC has no discretionary price-setting power in this case and has to purchase milk from the farmers on the price set by the processor based on the 6% fat content criteria on a weekly basis. In addition to this, the VMC receives a commission for collecting, storing and transporting milk to the processor's collection centres. The VMC is a self-employed person and operates under the supervision of the village council that has the powers to dismiss him as well. The VMC has to be vigilant of the quality of milk as it is tested again at the collection centres and if the fat content or milk quality falls short of the required standards, the milk is returned and any financial implications must be faced by him only.

³⁰Halla is a popular dairy brand name in Pakistan which is marketing pasteurized milk and dairy products.

The milk collected from farmers by *dodhis* is directly sold to the collection centres of the commercial dairy processors established in the villages. In this case, however, the price received by the farmers is not based on the fat content criteria as the *dodhis* set prices using personal discretion. The farmers may receive maximum price if they directly sell their produce to the commercial milk centres without involvement of intermediaries.

The collection networks established by commercial dairy processors aim to include: (i) rural subsistence-level farmers, (ii) rural smallholders, (iii) medium-sized producers, and (iv) peri-urban producers. The intermediaries have the opportunity to earn better returns if the milk collected is from the areas that are far-flung, relatively remote and lack proper road infrastructure. Additionally, these agents are further paid a premium by the commercial processors in the *lean* months of summer/monsoon season to ensure maximum supply³¹.

Milk Prices in Pakistan

The milk prices in Pakistan vary to a larger extent in the formal and informal dairy processing sectors. It has been observed that there has been a sharp increase in the import volume of powder milk since 2007 by large milk processors to satisfy the urban consumers' demand as is evident from Table 5. These processors use powder milk to produce liquid milk³² which is eventually packaged and sold through retail outlets in the country.

According to industry sources, in 2006 packaged milk in Pakistan was being sold at PKR 36/ litre (US\$ 0.37)³³. The decline in international prices of powder milk in recent years provided incentive to the large processors to import it in huge quantities with import prices coming down to PKR 22/litre (USD 0.23) in 2011. However, the domestic consumer was paying up to Rs. 65/litre (USD 0.68) in 2011 while the profit margins of these companies rose sharply. At present, a litre of packaged milk is exorbitantly priced at Rs. 90/litre or above and is becoming increasingly unaffordable for the domestic consumers. These prices are mainly applicable to the 3% milk formally processed in Pakistan. However, in the wake of rapidly increasing international prices of powder milk recently, the future prices of packaged milk in Pakistan seem to be unpredictable.

The remaining 97% milk being produced through informal channels in the country reaches the urban consumer in loose form through *Gawallas* (traditional milkmen) or milk retail shops and is currently priced at an average of PKR 70/litre (USD 0.73) in the city of Lahore. In 2011, loose milk in the informal sector was priced at an average of PKR 40/litre (USD 0.42) which indicates a sharp rise in loose milk prices as well. This increase can be attributed to a widening gap between demand and supply of milk, inflation, and rise in the cost of production during recent years.

Constraints in Domestic Supply and Value Chain

Conventional and Low-End Farming Practices

As mentioned above, the dairy sector of Pakistan is mainly dominated by the informal sector with about 95% of the total milk distribution. The informal sector lacks modern and high-end farming practises as has been the case with the rest of the agricultural sector of Pakistan. These farmers are less efficient in production and due to economic reasons there is less expectation of getting high yields from them in the short and even medium run. Due to a large livestock population, the country faces serious environmental concerns with regard to management of its solid and organic wastes. At the same time, a national level policy is lacking in the implementation of a *biogas*³⁴ or *bio slurry*³⁵ production initiative.

³¹ During these months/ period, the supply gap of milk increases due to low production levels in the country.

³² 1 kg powdered milk – 7.5 kg liquid milk (SMEDA)

³³ Based on current exchange rate of USD 1 = PKR 95

³⁴ Biogas typically refers to the gas produced as a result of breakdown of organic matter, consisting of dead plant and animal material, animal and kitchen waste. The gas can be utilized for heating for purposes, typically for cooking.

Efficiency Losses at Production and Distribution

The geographical dispersion of the large number of smallholders in the dairy sector and use of conventional transportation and calving practices has resulted in the wastage of almost 20% of the milk collected. This wastage mainly occurs due to delay in transportation and inappropriate storage facilities. According to an estimate, this wastage of the milk results in an average deficiency of 207 litres in the availability of milk to each Pakistani citizen per annum³⁶. This wastage results in low efficiency and profitability to the farmers and increases the country's dependence on imported milk and dairy products to cover the overall demand of these products.

Low Productivity per Animal

The productivity per *milch* animal is low as compared to its potential. The main reasons are lack of quantity and quality of feed, poor farm management, inappropriate breeding practices and lack of veterinary care. The milk productivity of Pakistani breeds is almost one fifth of similar breeds in Germany although the herd size of *milch* animals is thrice that of Germany.³⁷ However such a comparison has been criticised due to the facts that a country like Germany is developed and does not face the socio-economic constraints as Pakistan does. It also employs technologically advanced dairy farming practises that render such comparisons inappropriate.

On the other hand it is heartening that the annual yield per buffalo and cow in Pakistan is higher than other South Asian countries like Sri Lanka, India, Bangladesh and Nepal that have comparable socio-economic and climatic conditions for livestock breeding.³⁸ The productivity comparisons are reflected in Table 6.

It may however be noted that ever since the import of livestock started into Pakistan from the year 2006 onwards, there has mostly remained a disproportionate reliance on the breeds of Australian origin. These cows have a daily average production of 10-15 litres of milk. Besides, these cows are found to have limited compatibility with the local feed. Contrary to this, the recent research has shown that the milk production of Swedish and Danish cows is much more as compared to the Australian breed. The average daily output from these *milch* animals is about 33-35 litres. These cows are also compatible to the local feed but require to be kept in controlled environment (under 26 degree Celsius) which is an expensive but yet viable option for big producers. Larger investments and favourable government policy to facilitate breeding of these cows would greatly facilitate the milk production and help in overcoming the supply–demand gap in the medium and long run.³⁹

There is a disadvantage associated with the imported breeds. These animals are highly prone to the “tick-borne”⁴⁰ disease to which the local breeds have higher immunity. However, with technology and better veterinary practices this issue can be handled.

³⁵Bio-slurry is decomposed organic mass that can be used as a fertilizer to enrich soil and increase agricultural yield

³⁶ Milk as Food Security in Pakistan, Abdul Razzaq, Vet News and Views, 2005

³⁷ International Farm Comparison Network (IFCN) Report, 2003

³⁸ Dairy Development in Pakistan, Umm e Zia, T. Mahmood and M.R. Ali, Food and Agriculture Organization (FAO), 2011

³⁹ SMEDA

⁴⁰ Ticks are parasites that are bred on the skin of animals. They not only suck blood but also create weakness in their hosts. These also act as major disease carriers between various species of animals. They can be fatal for the young livestock and can be limiting factors in livestock productivity.

Table 6: Annual Yield Comparison of South Asian Milk-Producing Countries

Annual yield/animal (tonnes)					
Buffalo					
Year	Pakistan	Sri Lanka	India	Bangladesh	Nepal
2003	0.750403	0.089286	0.48999	0.025882	0.216146
2004	0.75451	0.083333	0.511417	0.025882	0.217722
2005	0.755894	0.086667	0.527024	0.025882	0.218137
2006	0.744014	0.087097	0.558704	0.025882	0.219048
2007	0.787546	0.087097	0.577102	0.025882	0.213303
Average	0.758473	0.086051	0.532848	0.025882	0.758473
Cow					
Year	Pakistan	Sri Lanka	India	Bangladesh	Nepal
2003	0.365236	0.111864	0.188843	0.032245	0.051942
2004	0.364282	0.115517	0.204055	0.032389	0.052874
2005	0.365289	0.115254	0.21982	0.32369	0.05422
2006	0.368627	0.114876	0.229435	0.032351	0.055
2007	0.371622	0.117213	0.236955	0.032332	0.05483
Average	0.367012	0.114945	0.215821	0.032337	0.053773

Source: Food and Agriculture Organization of the United Nations (FAO) , 2011

Feed and Nutrition

Low productivity per *milch* animal is mainly due to limited availability of high quality fodder and sufficient quantity of water. Milk productivity levels naturally rise up to three times in the months of November and December due to the availability of a high nutritious forage called *Berseem*.⁴¹ Furthermore, there is lack of awareness in the farmers' community on feed control and balanced diet which is required to maintain health and desirable yield levels. The dietary decisions are taken on the basis of decades of old traditional practices particularly in the rural areas. The animals are fed with the fodder that grows as an agriculture residue and with other crops that are not preferred for human consumption.

A decrease in the cultivable land each year due to insufficient supply of water and shrinking resources in the farm community have led to limited availability of appropriate fodder for the *milch* animals. This has also resulted in an increase in the prices of appropriate feed which mostly remain out of the affordability limits of farmers, mainly in the rural areas. The situation gets worse during the peak summer and winter seasons (May, June, December and January are the harvesting months for wheat and cotton mainly) when the supply of animal feed shrinks and becomes expensive at the same time.

Insufficient Veterinary Services

Major diseases in the farm animals are the Foot and Mouth Disease (FMD), Hemorrhagic Septicemia (HS), and Mastitis in large ruminants. In small ruminants, diseases such as Enterotoxemia, Caprine Pleuro Pneumonia and *Peste des Petits Ruminants* (PPR) is common.⁴² These need to be treated through the available veterinary institutions located in most parts of the country.

After the devolution of powers under the 18th constitutional amendment, the responsibilities relating to providing veterinary services are now assigned to the provinces. Under the new scenario, the federal government is responsible for planning and implementing of the national policies, coordination with provincial, national and international agencies on matters relating to research and development, sectoral and trade development, standardization and compliance, quarantine and foreign assistance programmes

⁴¹A leguminous, winter fodder crop that is high in essential nutrients and provides easy and suitable digestibility to the livestock

⁴²FAO Pakistan, 2010

etc. The veterinary services provided under the administrative control of the provinces are briefly explained with the help of Table 7.

Table 7: Veterinary Service Institutions in Pakistan

Region	Research/vaccine production institutes	Veterinary Hospitals*	Veterinary dispensaries	Veterinary centres	Diagnostic labs
Punjab	1	530	1213	1713	28
Sindh	2	119	60	608	7
NWFP	1	98	363	218	7
Balochistan	1	116	783	.	15
Northern Areas	.	12	165	.	7
Federally Administrated Tribal Areas	.	25	212	207	1
Islamabad Capital Territory	1	4	7	.	1
Azad Jammu and Kashmir	.	59	66	129	6
Total	6	963	2869	2875	72

* Veterinary hospital is an institution where at least one veterinarian is posted along with other paraprofessional staff and there are facilities for artificial insemination also. Each veterinary dispensary is mostly headed by a veterinarian and a veterinary centre is headed by a veterinarian paraprofessional.

Source: Pakistan Agricultural Research Council, Islamabad, Pakistan, 2009

It is worth mentioning that after the devolution of powers, there still exist ambiguity on the federal and provincial levels as to the management of retained and devolved functions in federal and provincial governments. This has created accessibility issues among the stakeholders to the veterinary services, particularly in the informal sector.

Further to the above, the livestock sector is encountering health and treatment issues including disease diagnosis, monitoring and reporting. Other issues include lack of national policies on eradication and control of animal diseases, informal inward trade of inappropriate livestock, poor quality assurance and control in vaccine and veterinary drugs available in the public sector. Insufficient availability of vaccines is also an issue of concern which increases mortality in the farm animals.⁴³

Limited Vertical Integration and Clustering in Dairy Sector

As mentioned in the preceding paragraphs, approximately 3% of the total national milk supply is formally processed by the big players. Largely there is an absence of integration between various parts of the milk supply chain. This is mainly due to the reason that the conventional methods of milk collection and distribution surpass the organized milk collection and processing channels. This factor hinders overall growth of the sector and largely restricts value addition.

There are very few incidents where the dairy chain has been integrated to produce high quality milk and dairy products. Taking one practical example of Engro Foods where the company has made better connectivity with large dairy farms to improve milk supply and also help them to adopt better farm management practices. The company has also established corporate dairy farming in the private sector which ensures timely supply of quality milk for processing and producing other dairy products. Some other big farmers such as Sapphire Dairies, Dada Dairies, Al-Tahur Dairies, Sharif Dairies etc, have already integrated their supply chains by establishing commercial farms. They are producing and marketing packaged and pasteurised milk and other milk products to the domestic consumers through their own resources.

Furthering the concept of vertical integration and forming clusters and cooperatives in the dairy value chain in the other parts of dairy sectors involving existing and new stakeholders would help in meeting required

⁴³Punjab Livestock and Dairy Development Department

standards and facilitate healthy competition in the dairy processing industry. This would be helpful for both producers and consumers where on one end the producers would have bettered their production and distribution system and on the other the consumers will have access to a large variety of quality dairy products at their door steps. This phenomenon along with other initiatives of government would facilitate formation of a strong dairy industry in the long run that would not only involve most parts of informal dairy producers but also further develop and integrate value added industry. The overall objective of achieving self-reliance in dairy production and producing exportable surplus would also become possible.

Value Addition Issues

As mentioned earlier, integration of value chain in the dairy sector would greatly facilitate in providing larger opportunities to the stakeholders who could add value to the dairy products through specialization. Having an inherited edge of milk production and higher milk yield as against the regional competitors offers great opportunities for the Pakistani dairy sector to move to the high end products. The current scenario in the dairy sector does not promise much to meet existing and anticipated domestic demands unless certain major reforms are introduced in the dairy sector.

In order to facilitate value addition, measures on part of the government as well as private sector are urgently needed. Replacement of obsolete or low end technology, mobilizing financial resources to facilitate existing and new entrants in the dairy business through agricultural credit schemes, awareness on modern farming and processing techniques, knowledge of health and animal safety standards and avenues for export business are to be worked out. Training of entrepreneurs as well as of skilled and semi-skilled workers in the farms and industry is also required to meet the desired quality and standards.

Some of the ways to facilitate value addition include transforming milk into value added products through (i) *Churning* (butter, butter milk fat products, Ice cream etc), (ii) *Evaporation* (dry or condensed milk), (iii) *Pasteurization/UHT* (fermented products, yogurt, buttermilk, cheese, sour cream), and (iv) *Homogenization* (skimmed milk, fortified milk, flavoured milk, whipped cream etc). Other ways to add value without changing the form of milk include packaging and branding that make products distinct from others and fetch premium prices due to their likeness by the consumers. The small and medium enterprises (SMEs) without involving large investment can also earn good profits through on-farm processing of the milk and by producing organic products which are liked by a sizable segment of urban consumers.⁴⁴

Standardization and Compliance

One of the main disadvantages of conventional milk collection and distribution through *dodhis* and use of unhygienic methods of milking by majority of subsistent farmers is quality and hygiene. This is further aggravated by improper storage and transportation facilities and adulteration⁴⁵ of milk carried out by the milkmen.

The above factors contribute to contamination of fresh milk making that is extremely high in microbial load; measured as Total Plate Count (TPC) per millilitre (ml). The figure can go up to millions of TPC per ml, which makes milk produced in the informal sector highly unsuitable for human consumption.⁴⁶ According to various stakeholders, including milk processors and veterinary health specialists, about 90% of the total milk produced in the dairy sector of Pakistan cannot be consumed at all. This obviously proves to be a huge and constraining challenge for not only meeting the hygienically safe milk for the domestic consumption but also for producing required high quality exportable surplus. However, milk procured directly from the farmers or produced in the formal sector is of much better quality and can provide high nutritional value to the domestic consumers.⁴⁷

⁴⁴Value addition in small dairy products, by Dr Rao Zahid Abbas, Dr Zafar Iqbal & Dr Abdul Jabbar, Dawn Newspaper

⁴⁵Milk in the informal sector is mainly adulterated through the dilution of water, often from unhygienic sources, to increase its volume and subsequently the milkman's profits. The water may be contaminated with heavy metals, anti-biotic residues, aflatoxins and pesticide residues. This adulteration leaves very little nutritive value for the consumer and raises the risk of affecting public health negatively. (Milk Processors)

⁴⁶A private, leading dairy consultancy based in Lahore

⁴⁷ According to industry sources, the quality of milk is highest in the city of Karachi due to increased consumer awareness and consequent impact on the demand. The quality is also ensured through a rapid urban farm-to-market linkage in which milk is sold to

ENHANCING DAIRY SECTOR EXPORT COMPETITIVENESS IN PAKISTAN

In the absence of an appropriate and well placed monitoring and standardization regime, the consumers would remain subject to exploitation. Weak presence of a quality and standardization regime further restricts growth opportunities of dairy sector which further make the dairy sector uncompetitive in the export markets that are regulated by quality and standardization principles.

the consumer in less than 2 hours from the time of the animal being milked. As per estimates, the daily turnover of milk sold in the city reaches an average of 5,000 liters/ day.

SECTION 3: TRADE POTENTIAL OF DAIRY PRODUCTS



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Performance of Dairy Sector in Exports

The preceding sections have highlighted importance of dairy development in overall economic progress of the country. Despite huge potential in dairy field, there is heavy dependence on imports due to the fact that the dairy sector is encountering problems such as capacity constraints, low milk average per unit, awareness and hygiene related issues, low value addition and supply congestions etc. Therefore, mainly due to the above factors, the export potential of the dairy products has not been fully exploited. It is also established in the preceding sections that Afghanistan, the current major market for Pakistani milk is buying to fulfil dietary needs of its population and balance its home market which is lacking domestic supply due to deterioration of its national herd as a result of decades' long wars.

Table 8 contains some of dairy products that Pakistan is currently exporting to various countries. It gives a fair idea of the product categories and export levels in these products.

Table 8: Export of Dairy Products from Pakistan

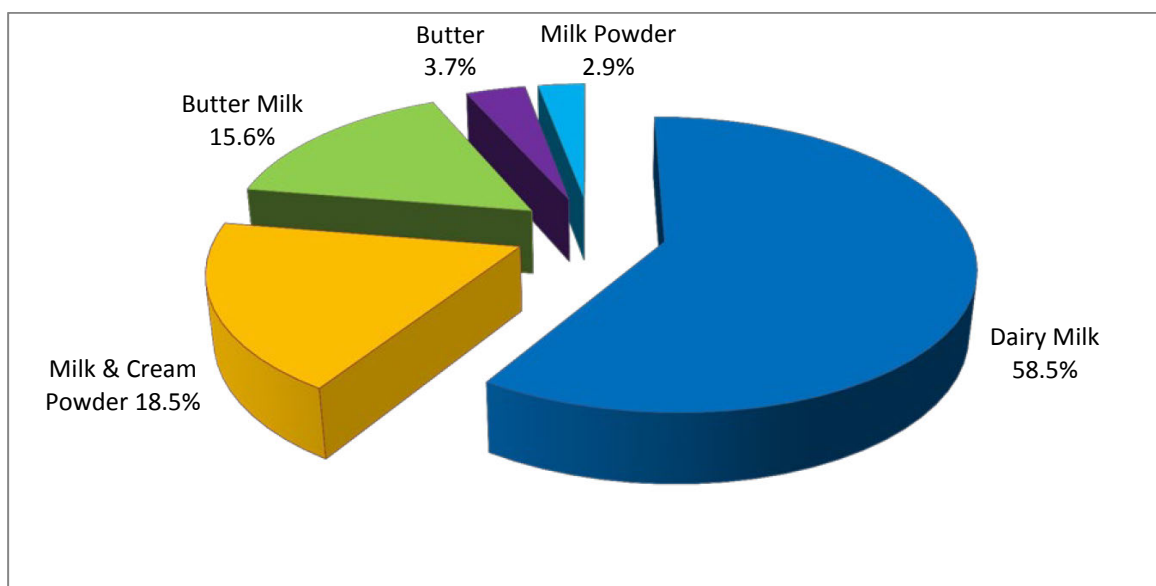
(Export value in 000' US Dollars)

Product Category	2007	2008	2009	2010	2011	Destinations
DAIRY PRODUCTS (HS 0401-0406) <i>excluding honey</i>	31,134	30,849	40,018	41,389	64,734	Afghanistan (96%), Tunisia, Singapore, Oman, USA, Saudi Arabia, UAE, Jordan, Iran etc.
Dairy milk	22,373	14,173	21,322	25,043	37,873	Afghanistan (99.9%), Tunisia
Milk and cream powder	1,019	6,846	8,077	5,461	11,941	Afghanistan (99%), UK
Butter milk, curdled milk and cream	3,203	6,753	6,127	7,387	10,075	Afghanistan (99%), USA
Butter and other fats and oil derived from milk	302	782	428	1,882	2,349	Singapore, Oman, Saudi Arabia, Jordan, UAE, Iran.
Milk powder group	3,946	2,132	1,838	159	1,819	Afghanistan (99%), USA, Hong Kong, South Africa
Cheese and curd	14	27	1	0	3	USA, UAE

Source: Author's calculations based on UN COMTRADE statistics

From the above data, it can be deduced that the high value added products such as butter, cheese, packaged milk, ghee, flavoured yoghurt etc. are not being exported in high quantities while the processed dairy milk and some preparations from milk are exported to various destinations but mainly to Afghanistan which is beneficiary of approximately 96% of total exports of dairy products from Pakistan.

Figure 6: Pakistan's Dairy Export Mix



Source: Author's calculations based on UN COMTRADE statistics

Analysis of Dairy Export Basket of Pakistan

Pakistan export basket for dairy sector is dominated by three product categories namely:

- i. Dairy Milk (HS Code 040120- milk not concentrated and unsweetened exceeding 1% not exceeding 6% fat and HS Code 040110- milk not concentrated and unsweetened not exceeding 1% fat),
- ii. Milk and Cream Powder (HS Code 040221- milk and cream powder unsweetened exceeding 1.5% fat and HS Code 040229- milk and cream powder sweetened exceeding 1.5% fat), and
- iii. Buttermilk (HS Code 040390- buttermilk, curdled milk and cream, kephir and ferm or acid milk and cream nes). These three categories constitute almost 93% of Dairy Sector's export from Pakistan.

Dairy Milk

Pakistan's exports of dairy milk are predominantly directed to Afghanistan that typically takes more than 90% share of dairy milk. In 2011, Pakistan's exports of dairy milk products were recorded to be US\$ 37.873 million out of which US\$ 37.867 million were exported to Afghanistan. That accounts for 99.98% of total exports of dairy milk products. Afghanistan's total import of dairy products in 2011 was US\$ 41.50 million with Pakistan's share in exports remained 98%. Other export markets for Pakistan in the same period were Tunisia, Australia, Canada and USA. Time series analysis of these markets reflects inconsistent export trends.

Potential Markets for Pakistan

Analysis of exports of the dairy milk from Pakistan to the EU reflects that Pakistan might not be able to find place in the EU markets since the intra EU trade in dairy milk was recorded at US\$ 4,685 million as against its total import of US\$ 5,584 million in the same category. This accounted for about 84% of EU's total import of dairy milk. On the contrary, the EU's import from Asian countries in dairy remained at US\$ 0.643 million or 0.01% of its total imports in the same category.

Market analysis on export of dairy milk from Pakistan to Gulf Region reflects that in these countries also, Pakistan might not be able to gain immediate market share due to the fact that intra Gulf Cooperation Council (GCC) trade in dairy milk is very strong. It was recorded at US\$ 17.239 million which was almost 72% of total imports of GCC is in dairy milk. GCC countries imported dairy milk to the level of US\$ 0.076 million, accounting for 0.32% of their total imports in the same product category.

For short and medium term, Pakistan's potential exports markets for dairy milk can be Singapore, Hong Kong and Philippines, mainly due to market size and geographical location of these countries. Table 9 reflect time series export value, quantity and unit value of dairy milk imported by these countries from 2007 to 2011. The statistics show that all targeted or potential markets provide desired profitability that can be compared with the prices offered in Afghanistan. But since Pakistan has already taken a major share in Afghanistan's market, the most viable markets that could be explored in the short run are Singapore, Hong Kong and Philippines.

Singapore applies zero ad-valorem tariff (estimated, based on the data from 2010 using Harmonised System Nomenclature Rev. 07, to products originating from Pakistan). Hong Kong (SAR China) applies zero ad valorem tariff (estimated, based on the data from 2012 using Harmonised System Nomenclature Rev. 12, to products originating from Pakistan). Philippines applies 3% ad valorem tariff (estimated, based on the data from 2007 using Harmonised System Nomenclature Rev. 02, to products originating from Pakistan). Pakistan has been awarded MFN status by all the said countries.

Table 9: Dairy Milk Imports by Potential Countries

(Export value in 000' US Dollars)

Countries	Value 2007	Value 2008	Value 2009	Value 2010	Value 2011
Singapore	37,299	48,748	46,398	57,599	66,541
Hong Kong	41,245	45,992	47,453	55,287	60,541
Philippines	29,098	36,016	30,009	45,399	47,350
<i>Volume in Tons</i>					
	Quantity	Quantity	Quantity	Quantity	Quantity
Singapore	46,854	50,579	51,806	60,096	63,455
Hong Kong	56,266	51,870	50,993	55,976	60,296
Philippines	40,792	41,470	43,747	54,496	51,129
<i>US Dollar Thousand</i>					
	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton
Singapore	796	964	896	958	1,049
Hong Kong	733	887	931	988	1,004
Philippines	713	868	686	833	926
<i>Afghanistan</i>	<i>849</i>	<i>667</i>	<i>729</i>	<i>880</i>	<i>940</i>

Source: International Trade Centre (ITC)

Table 10 shows leading suppliers or competitors of Pakistan in potential markets.

Table 10: Partner Countries of Potential Dairy Milk Import Markets

Potential Markets	Supplying Countries in 2011
Singapore	Thailand, Australia, Indonesia, New Zealand and India.
Hong Kong	Australia, China, Indonesia, Japan, Thailand and India.
Philippines	New Zealand, Brazil, Thailand, Australia and India

Source: Author's calculations based on UN COMTRADE statistics

Milk and Cream Powder

Pakistan's export of milk and cream powder is predominantly directed to Afghanistan that characteristically takes more than 95% share of dairy milk. In 2011, Pakistan's exports of milk and cream powder products was recorded at US\$ 11.941 million out of which US\$ 11.871 million was exported to Afghanistan. That accounted for 99.41% of total exports of this category only to Afghanistan. On the other hand, the total imports of Afghanistan in the said category were recorded at US\$ 14.36 million in the year 2011. Pakistan's share in Afghanistan's market was 83% (about US\$ 12 million). Other markets to which Pakistan exported these products in the same period were UK, Canada, United States and Hong Kong.

Potential Markets for Pakistan

Analysis of exports in milk and cream powder products from Pakistan to EU reflects that Pakistan may not be able to find an easy entry into the EU market due to strong intra EU trade in the said product category. The intra EU trade during 2011 in milk and cream powder was recorded at US\$ 1,099 million, almost 99% of total EU's imports of US\$ 1,110 million) while imports from the Asian countries remained 0.06% of the total or US\$ 0.659 million.

The analysis of export of milk and cream powder from Pakistan to GCC (six countries) reflects that Pakistan may be able to find its space in GCC as intra GCC trade in 2011 stood at US\$ 146 million, which was almost 18% (total import of GCC stood at US\$ 808 million), while GCC imports from Asia excluding GCC stood at just US\$ 12 million (almost 1.49% share). For short and medium term, Pakistan's potential exports markets for milk and cream powder products can be Indonesia, Singapore, Nigeria and Sri Lanka.

In order to choose potential markets following parameters were considered:

- Import market size (including import trends)
- Geographical location (nearness of market from Pakistan)
- Unit price value of product
- Tariff applied by the potential country

Table 11 reflects time series export value, quantity and unit value of milk and cream powder products imported by these countries from 2007 to 2011.

According to the statistics, all targeted potential markets provide desired profitability which can be compared with the prices offered in Afghanistan but as Pakistan has already taken a large share in this market, the only viable markets in the short run are Indonesia, Singapore, Nigeria and Sri Lanka. Indonesia applies 5% ad valorem tariff⁴⁸ Singapore applies zero ad valorem tariff⁴⁹. Nigeria applies 15% ad valorem tariff.⁵⁰ Sri Lanka applies 30% ad valorem tariff.⁵¹ Pakistan has been awarded MFN status by all the said countries. Although Pakistan has Free Trade Agreement (FTA) with Sri Lanka, however, these products are placed in negative list.

⁴⁸ Estimated, based on the data from 2011 using Harmonised System Nomenclature Rev. 07, to products originating from Pakistan..

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Ibid.

Table 11: Dairy Milk and Cream Powder Imports by Potential Countries
(Export value in 000' US Dollars)

Countries	Value 2007	Value 2008	Value 2009	Value 2010	Value 2011
Indonesia	293,914	342,057	153,435	213,105	327,288
Singapore	231,339	320,944	207,301	280,327	321,683
Nigeria	584,435	225,137	170,517	157,495	312,324
Sri Lanka	159,350	255,356	143,174	229,947	298,945
<i>Volume in Tons</i>					
	Quantity	Quantity	Quantity	Quantity	Quantity
Indonesia	84,743	84,335	50,311	42,839	67,591
Singapore	61,403	73,247	73,870	82,531	81,035
Nigeria	230,843	62,488	239,860	149,090	67,626
Sri Lanka	57,142	56,995	56,023	67,066	75,780
<i>US Dollar Thousand</i>					
	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton
Indonesia	3,468	4,056	3,050	4,975	4,842
Singapore	3,768	4,382	2,806	3,397	3,970
Nigeria	2,532	3,603	711	1,056	4,618
Sri Lanka	2,789	4,480	2,556	3,429	3,945
<i>Afghanistan</i>	<i>4,125</i>	<i>4,155</i>	<i>3,066</i>	<i>3,871</i>	<i>3,660</i>

Source: ITC

Table 12 shows leading suppliers in the potential markets of Pakistan.

Table 12: Dairy Milk and Cream Powder Imports by Potential Countries

Potential Markets	Supplying Countries in 2011
Indonesia	New Zealand, Australia, Philippines, Singapore, Netherlands.
Singapore	New Zealand, Australia, Malaysia, Ireland, Netherlands.
Nigeria	New Zealand, Barbados, Netherlands, Andora, Ireland.
Sri Lanka	New Zealand, Australia, Malaysia, Netherlands, Singapore

Source: Author's calculations based on UN COMTRADE statistics

Butter Milk

During the year 2011, Pakistan's exports of butter milk products stood at US\$ 10.075 million out of which US\$ 10.065 million was exported to Afghanistan that constitutes to 99.90% of total exports of buttermilk. Moreover, Afghanistan's total imports of butter milk in 2011 were US\$ 11.53 million out of which Pakistan dominated in the exporting countries with 87% share in total imports of butter milk to Afghanistan. Rest of exports were directed towards United States and Mozambique.

Potential Markets for Pakistan

Market analysis for export of buttermilk from Pakistan to EU reflects that Pakistan may not be able to find its place in the EU as intra EU trade in 2011 was recorded at US\$ 993 million that was about 99 % (total

import of EU stood at US\$ 997 million), while EU imports from Asia stood at merely US\$ 175 thousand (almost 0.02% share).

The potential market analysis for export of buttermilk from Pakistan to GCC (six countries) reflects that Pakistan may not be able to find a handsome market share in the GCC as intra GCC trade in 2011 was recorded at US\$ 30 million that was almost 65% of total trade between these countries (total import of GCC stood at US\$ 47 million). Imports of the GCC countries from Asia (excluding intra GCC trade) stood at just US\$ 10 thousand (almost 0.02% share). For short and medium term, Pakistan's potential exports markets for butter milk can be Philippines, Thailand and Bahrain, primarily due to market size and geographical location of these countries.

Table 13 provides an account of time series export value, quantity and unit value of buttermilk imported by these countries from 2007 to 2011. As per statistics, all targeted/ potential markets provides desired profitability, which can be compared with the prices offered in Afghanistan but as Pakistan has already taken a large share in this market, the only viable markets in short run are Philippines, Thailand and Bahrain. Philippines applies 5% ad valorem tariff.⁵² Thailand applies 17.5% ad valorem tariff.⁵³ Bahrain applies 5% ad valorem tariff.⁵⁴ Pakistan has been awarded MFN status by all the said countries.

Table 13: Dairy Milk and Cream Powder Imports by Potential Countries
(Export value in 000' US Dollars)

Countries	Value 2007	Value 2008	Value 2009	Value 2010	Value 2011
Philippines	59,711	60,022	35,084	49,484	67,864
Thailand	41,390	58,179	28,785	47,907	52,242
Bahrain	12,734	20,444	16,262	8,943	22,698
<i>Volume in Tons</i>					
	Quantity	Quantity	Quantity	Quantity	Quantity
Philippines	20,805	17,690	23,000	20,026	21,290
Thailand	12,599	14,775	14,092	15,507	14,560
Bahrain	13,326	20,446	14,052	6,915	19,464
<i>US Dollar Thousand</i>					
	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton	Unit Price US\$/Ton
Philippines	2,870	3,393	1,525	2,471	3,188
Thailand	3,285	3,938	2,043	3,089	3,588
Bahrain	956	1,000	1,157	1,293	1,166
<i>Afghanistan</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>2,887</i>

Source: ITC

Table 14 provides an account of main competitors of Pakistan in potential markets.

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Ibid.

Table 14: Dairy Milk and Cream Powder Imports by Potential Countries

Potential Markets	Supplying Countries in 2011
Philippines	New Zealand, Australia, USA, Ireland, India.
Thailand	New Zealand, Netherlands, USA, Finland, Ireland.
Bahrain	Saudi Arabia, Turkey, Kuwait, UK, Netherland, India.

Source: Author's calculations based on UN COMTRADE statistics

Factors Affecting Export of Dairy Products

Similar to the supply side constraints, the export growth is also affected by a number of factors which are summarized below.

Historical Factors

At the time of independence, most of the farm animals were either taken away by the evacuees or indiscriminately slaughtered by refugees to meet their immediate food requirements. This was followed by slaughtering of the dry animals that were initially brought to the urban centres for milking purpose and were slaughtered after the end of lactation period [(Barki, et al. (2006)]. This created bigger challenge for the policy makers and required certain appropriate measures to increase draught power and milk production at the same time.

A number of initiatives were taken in the first five year plan (1955-60) for the development of dairy sector with an overall objective to achieve self-reliance in milk production through adopting modern health and safety and production techniques. However the objectives could not be achieved due to weak implementation mechanism and changing priorities of the government which in the subsequent years were focussed more towards the crop sector development while the objective of enhancing milk production remained an unattended priority. Therefore as of today, the objectives of having a modern and value added dairy industry with sufficient capacity to produce exportable surplus has remained a challenge and an unaccomplished task.

Generating Surplus

As evident from empirical and historical data and its analysis contained in the above section, generating exportable surplus from the available supplies or through introduction of developmental initiatives has always remained a challenge. Heavy proportion of milk production is in the unorganized sector and that too is mainly with the subsistent farm community⁵⁵. Wastage of milk during transportation and calving, low productivity in majority of farm animals due to inherent weaknesses and inappropriate feed, lack of interest in majority of farmers' community to adopt best breeding and milking practices, limited investment in the value added industry etc. are the main factors that restrict availability of exportable supplies and therefore Pakistan despite being one of big milk producers has not been able to enjoy benefits from its comparative advantage.

Pakistan's *milch* cattle yield is almost one fifth the European average.⁵⁶ The production of milk can substantially be enhanced through scientific feeding, breeding and marketing. Although the investors are inclined to enter into this segment but lack of information on modern farming methodologies and marketing channels that would ensure disposal of their produce and let them earn good value for their money restricts them from taking instant decisions. For this, an institutional mechanism is required to be established to facilitate potential investors and educate them on the farming methods and to also establish linkages with the upstream industry. There is also need for the carrying out training of the farmers in modern feeding and

⁵⁵Up to 43% of dairying households still operate under conditions of subsistence with herd size of one or two. Another 28% of the households operate under conditions of near subsistence [Barkiet al. (2004)] with herd size between three to four animals.

⁵⁶Mid Term Imperative and Strategy for Pakistan, Final Report of the Panel of Economists, Planning Commission, Government of Pakistan (April, 2010)

breeding practices as well as establishing proper logistics for milk collection and transportation through cool chain system which can be readily available for exports.

Farm-to-Market Distribution

The farm-to-market supply mechanism is a mix of organized and unorganized distribution system. Supplies from the rural farm communities are linked to urban centres through dodhis (milkmen) who usually do not pass on real financial benefits to the farmers at large. Larger farms, mainly with more than 50 animals and those located in peri-urban areas, have relatively convenient access to the urban market centres. Further, big players in the processing industry have convenient access to these producers and therefore their quality, price and distribution networks are much better.

However, due to the fact that urban consumption accounts for 29% of total milk production in the country and only 3% of total milk production is channelized into value added production by the big players, the supply constraint for the value added industry has mostly remained a major obstacle in enhancing production and achieving high growth targets.

Local Market Factor

Local markets have higher demand than domestic supply. These markets also offer good value for the milk products such as fresh milk, ghee, butter and yoghurt. Very recently, there has been the emergence of new players into the dairy value added industry, but on a limited scale. Large and medium sized farmers are adopting measures to upgrade their farms with high milk yield animals either through imports from milk producing countries such as Australia, Canada and Denmark. or by raising new varieties through Artificial Insemination (AI) technique. They have also developed packaging and cool chain systems besides establishing modern milk supply shops in the urban centres such as Islamabad, Lahore, Faisalabad and Karachi.

Beside supply constraint, there seems to be limited interest on part of market players towards exporting these products as the local markets offer good prospects to these businesses. Other main obstacles in the export of dairy products include; (i) requirement of large investments for exports, (ii) unpreparedness to meet importing country's hygiene or sanitary and phyto-sanitary (SPS) standards, and (iii) limited knowledge of export markets.

Investment in Value Added Export Sector

The establishment and development of a value added export industry in the dairy sector will have positive spill-over on the supply side. The concept of demand creation leads to resource generation in key areas including milk production and distribution. Recently, some of the large companies have been found to be extensively engaged in linking farms with markets by establishing a well-coordinated supply chain system. They have been organizing the conventional collection system into modern systems where milk collection centres have been formed near the villages and cooling tanks are also made available to preserve milk during its transportation from the collection points to the processing units. Farmers and dodhis are offered better returns for their prompt and quality supply of milk. This has provided an opportunity to the farmers and distribution agents to improve their paraphernalia and add value to their respective areas of work.

However, the overall outreach still remains limited as geographically the farmers and the household milk producers are widely scattered and to approach them for milk collection involves huge costs. Therefore these efforts are required to be pushed further through the promotion of investment in the priority areas such as procurement and distribution. The formation of clusters and cooperatives in milk and dairying can also facilitate the efforts to form collection and distribution points all over the country. In India, Amul Dairy

model⁵⁷ is an example and success story of a local cooperative which owns an impressive share in the local dairy industry of India.

Investment in the value added industry will only be enhanced if the condition of creating an efficient farm-to-market supply chain system is met. This needs to be supplemented with farmers' education and adoption of latest methods of farm management even at subsistent levels in order to ensure enhanced yield per animal and ensuring surplus generation for the value added industry.

Integration of Export Value Chain

Weak integration in export value chain is again a product of inappropriate farm to market distribution system and limited knowledge sharing between stakeholders. Various attempts were made in the past to develop an organized value chain system but the pace of such initiative could not take a desirable pick up. Inconsistent supplies with varying quality levels also create production and quality related issues for the value added industry. Insufficient supplies on some occasions result in limited capacity utilization and make products expensive and thus uncompetitive at the same time. Most of the dairy product production processes are not closely integrated. For example the products extracted from milk, in most instances, are produced at one place, processed at another, packed at a third place by a vendor and sold by a separate distribution system. This weakens overall control on the value chain and therefore as a result, the quality, quantity and costs go beyond controls.

Integrated value chain system results in efficiencies, production controls, standardization and quality assurance and therefore it is most desirable in the dairy production system.

Brand Development and Promotion

Developing brands is an expensive business. Branding in the international market place is even more challenging and involves huge costs. During the past two decades, some international and local dairy producing companies have introduced various brands such as Haleeb (Chaudhry Dairies), Milk Pak (Nestle), Olpers (Engro Foods), Halla, and Nurpur (NurPur Dairies). These, as well as some others, share the domestic milk and processed dairy market among them. These brands also sell packaged milk (UHT and pasteurized), butter, ghee, yoghurt, flavoured milk, and chocolates besides selling powdered and instant milk. Some of these companies are selling value added dairy products in the neighbouring markets such as Middle East and Afghanistan. However, as shown from the statistical analysis made in the preceding sections, the export growth of value added dairy products is quite slow and in some products it is either negligible or declining.

The main reason for sluggish export growth is the absence of a competitive export industry and the presence of an industry which mainly is catering to the domestic needs and making higher profits. Another reason is the presence of a large number of reputable competing brands with a huge variety of products in each product category (flavoured milk and yoghurt in many flavours and packaging) in the international markets as against a tiny product mix of Pakistan which has limited capability to compete with these products. The Pakistani brands are also facing tough competition from international brands in the local markets which are finding places on the shelves of almost all big general and super stores across the country.

Geographic Diversification

After having addressed the issues of supply chain, quality and standardization, the next step is to identify and approach target markets for exploring trade opportunities for dairy products of Pakistan.

Pakistan adopted a "Rapid Export Led Growth Strategy" (REGS) as its trade policy initiative in the year 2005. One of the major objectives of the policy was to exploit potential of Pakistani products in the non-

⁵⁷Amul Dairy with its 50 years long evolutionary history is a cooperative of 1176 village cooperative societies with more than 650,000 producer members with milk handling capacity of 2.4 million is the largest dairy cooperative in India. It is in the field of milk drying, whey drying and cattle feed manufacturing business besides in milk collection and handling area.

traditional markets.⁵⁸ The policy initiative was adopted for some products such as textiles, leather, rice, sports goods and surgical instruments. However, the dairy sector could not make inroads into international arena due to capacity, value addition and competitiveness issues besides the issue of standardization.

The data presented in Table 6 reflects Pakistan's trade in dairy products with the partner countries and shows that the export volumes to countries other than Afghanistan are negligible and therefore geographic diversification is missing at large.

Market Orientation

Pakistani exporters in the dairy sector have very limited orientation to international markets. The Pakistan's foreign missions and trade sections abroad are also generally not very helpful in identifying market opportunities in various countries. Lack of information also leads to wastage of opportunities. In dairy and other sectors of identical nature, the pull strategy is considered more appropriate as compared to the push strategy. The pull strategy is developed when opportunities are created in the first instance and later these opportunities are followed by push factors which motivate the domestic producers to cash the available opportunities and make good profits from international transactions through sale of products.

Market orientation provides greater insight and knowledge of the target markets. The exporters are relatively more aware than the producers and therefore a pull situation can also be created by the exporters or even by the trade missions of Pakistan located abroad to educate the producers and exporters about the opportunities as well as way of doing business in the potential markets abroad.

Compliance to Standards

Each country has its standards that are established to ensure that any goods coming into these markets are safe for human consumption and are not harmful for the health of plants and animals besides the health of humans. World Trade Organization (WTO) Agreement on Sanitary and Phyto-sanitary Measures (SPS) contains provision for the member countries to apply standards on imported products and therefore the food and some other products are subjected to the hygiene standards in the country of import.

The Pakistani dairy industry, in contrast to the processed meat industry is weak in terms of compliance to the international standards due to lower value addition and vertical integration and therefore the issue of compliance persists. The industry, in order to be more active and vibrant, needs to be compliant to the international standards and the accreditation agencies should be fully active in educating the dairy producers and potential exporters on the applicable standards and ways and means to comply with these. This would enable the industry to produce internationally compliant products in the dairy industry at large. Bolstered by its large domestic supplies, Pakistan has a high potential to export milk and dairy products to markets other than Afghanistan; if it is able to overcome the core issue of high bacterial count present in the milk produced in the informal sector as discussed in the earlier section.⁵⁹

⁵⁸Here non-traditional markets refer to the markets where Pakistan has no or very limited commercial presence. Historically, Pakistan has been exporting its products, especially leather, textiles, sports goods, surgical goods etc. to the European, US and Canadian markets. These markets, for most of Pakistani products, have become saturated, highly competitive and the profits have declined due to entry of new players into these markets and fierce competition from competitors, especially the regional competitors. Therefore need was felt to explore potential of markets located in Africa, Middle East, Oceania, Far East and Central Asian markets which are referred to as non-traditional markets in the trade policy language.

⁵⁹ SMEDA

SECTION 4: POLICY MEASURES AND REGULATORY FRAMEWORK FOR DEVELOPMENT OF DAIRY SECTOR IN PAKISTAN



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An Assessment of Governmental Policies

Agriculture Policy

Traditionally, agriculture has played a central role in the economy of the Pakistan. It accounts for over 21% of the GDP and employs over 45% of the total labour force of the country. The agriculture sector remains a significant supplier of raw materials to the industrial sector as well as is a major contributor in the exports of Pakistan. Despite the fact that Pakistan is an agrarian economy, appropriate and well thought out agriculture policy is mainly not available in the country.

After the 18th constitutional amendment, agriculture and livestock has been transferred from the federal list to the provincial list. The Ministries of Food and Agriculture and the Ministry of Livestock and Dairy Development have been devolved and their roles transferred to the provinces. Livestock still holds major importance in the agriculture economy of Pakistan. Therefore the national policy and planning, international and provincial coordination on animal diseases, import/export of livestock and livestock products, research on livestock diseases and animal quarantine still remain with the federal government. A new ministry, namely Ministry of National Food Security and Research, has been established and given certain important federal level functions in addition to the functions of the devolved ministries and departments.

To study the governmental policies towards agriculture and especially livestock and dairy, two national planning documents can be referred under the government's Framework for Economic Growth, the "Annual Report 2011-12" and the "Vision 2030", both prepared by the Planning Commission of Pakistan. The thrust of the framework remains "growth in agriculture by enhanced agricultural productivity, improved sector governance, sustainability of the system, reduction of volatility and augmenting competitiveness in agricultural marketing and trade, and improvement of the investment climate in the sector."

According to the annual report 2011-12, the livestock sector remained resilient despite heavy losses in the face of the unprecedented floods of 2010 and 2011 and consistently achieved the growth target of 4% consecutively during the periods 2010-11 and 2011-12. However, the dairy production remained below the target (i.e. 39 million tons as 46 million tons). The annual report further emphasises the need for better and stable functionality of the Pakistan Dairy Development Company (PDDC) under the Ministry of National Food Security and Research.

Other than the emphasis on research on the federal and provincial levels, devising a sustainable strategy for development of cool chain system is needed at the provincial levels to counter significant milk losses.

Dairy Development Initiatives in 2012-13

Several initiatives have been taken by the federal government under the Public Sector Development Program (2012-13). These include allocation of an amount of Rs. 495 million for on-going and new projects by the Ministry of National Food Security and Research. These include:

- i. Research for Agriculture Development Program including animal sciences,
- ii. "Special Programme for Strengthening SPS Facilities and Quality Inspection Services in Compliance with WTO-Establishment of integrated National Animal and Plant Health Inspection Services (NAPHIS)", and
- iii. Up-gradation and establishment of animal quarantine Stations in Pakistan.

The Government of Punjab has allocated an amount of Rs. 2.6 billion for the year 2012-13 for the livestock under the Medium Term Development Framework 2011-14.

Sindh has allocated Rs. 2.3 billion for 16 programs relating to livestock, while the rest of the provinces and territories have also increased their funding and program portfolio for livestock and dairy sectors.

The federal government in collaboration with the Food and Agriculture Organization of the United Nations (FAO) has executed a project to progressively control the Foot and Mouth Disease (FMD) in three year time (2011-13) in Pakistan. The program is being funded by the United States Agriculture Department. USAID has initiated a project in Khyber Pakhtunkhwa (KPK), Punjab and Sindh that includes sustaining the survival of livestock through the provision of feed, fodder and medicine under the Flood Recovery Agriculture Programs. The Dairy Program also funded by the USAID, to the tune of Rs. 2.5 million for 2011-14, aims to increase the productivity of 12,000 small-scale dairy farmers by 15-20% through farm management techniques, artificial insemination and promoting linkages with suppliers and higher value markets.

The Vision 2030

The Vision 2030 explains that the lack of essential development of the dairy and livestock sector has been due to poor quality of feed and health coverage, indiscriminate breeding of genetically inferior livestock that results in lower productivity, outdated and limited marketing facilities, lack of investment in R&D and market infrastructure. On the other hand, the sector has remained resilient by showing a sustained growth rate of 4-5 % in the past decade without any major investment. The government's vision is an efficient and competitive sustainable agriculture sector ensuring food security and having ability to contribute to the economic development for Pakistan.

The Livestock and Dairy Development Policy

The Government of Pakistan launched its first ever Livestock and Dairy Development Policy in 2007 which formally identified the livestock sector as the major source of economic growth and poverty alleviation for the country. The policy aimed to bring significant positive changes in the livestock and dairy sectors of Pakistan. Contrary to making livestock as part of the agricultural policy as per previous practice, the sector was given significance to provide an independent policy framework to accelerate its development.

The policy recognized that the demand for livestock and dairy products in Pakistan would rise primarily due to increase in population over the years and also the rise in income levels. It was also made clear that this demand could be met only through increasing the productivity per animal as the number of animals was already touching the maximum in terms of land and resources. The policy identified milk as the main product and beef and mutton as the by-products in livestock. It also identified the immense export potential of the livestock and dairy sectors.

Displaying the competitiveness of the livestock and dairy sectors, the policy contained a study in which a comparison of cost of milk production in 31 countries reflected that the Pakistani rural farmers produce milk at just US\$ 11 per 100 kg and remained most competitive after Argentina. In fact the country's rural farms were found to be more competitive than India, Bangladesh, Western Europe, North America and even Oceania.

The policy also identified the constraints faced by the livestock and dairy sectors including: (i) non-availability of superior germplasm, (ii) inadequate feed resources, (iii) epidemics of infectious diseases, (iv) poor marketing infrastructure, (v) low public sector investment, (vi) poor institutional infrastructure, (vii) outdated regulatory framework and (viii) limited availability and access to the farm credit.

To balance the above mentioned constraints, the policy provides for a "Private sector-led development with the public sector providing the enabling environment and building capacity." The strategy included the following four elements:

- i. Private sector-led livestock growth
- ii. Productivity enhancement of existing livestock resources
- iii. Moving away from subsistence farming to market-oriented commercial farming
- iv. Targeting entire value chain to enhance productivity and profitability

Keeping in mind the above strategic elements, the following key policy and institutional development measures were identified for the dairy sector:

- i. Review and updating of the existing legal and regulatory framework
- ii. De-regulation of milk prices
- iii. Rationalization of Taxes/ Tariffs at the government level
- iv. Easy access to affordable credit
- v. Level playing field for local dairy industry
- vi. Establishment of Livestock and Dairy Development Board (LDDDB) and PDDC
- vii. Re-orientation of public sector institutions including usage of government farms for superior male production, phased privatization of slaughter houses, public-private partnerships for vaccine production and improvement in research and development infrastructure and funding.

Fiscal Policy and Farm Credits

Currently 26 commercial and microfinance banks through a network of 3,900 agriculture designated branches are providing agriculture credit throughout the country. These include Allied Bank Limited (ABL), Habib Bank Limited (HBL), Muslim Commercial Bank (MCB), United Bank Limited (UBL), two specialized banks i.e. Zarai Taraqiati Bank Limited (ZTBL), Punjab Provincial Corporative Bank Limited (PCBL), and 14 private domestic banks. Furthermore, five microfinance banks (MFBs) are also providing financing to the farmers. Among other agricultural activities, livestock farming is also being extended credit.⁶⁰

Investment Regime and Policy

With a supply-demand gap that has widened up to 10-15% and being one of the lowest cost dairy producing countries in the world, dairy sector in Pakistan offers attractive opportunities for investments. It also maintains high profitability which mainly attracts the private sector.

The livestock and dairy development policy encourages private-sector led growth and the government has taken initiatives such as ensuring credit availability, setting up of private sector-led companies such as LDDDB and PDDC, and duty free import of dairy machinery to increase investment in the dairy sector.

Currently, investment opportunities lie in milk pasteurization, commercial dairy farming, value-added dairy products, cold chain systems, vaccine production and veterinary pharmaceutical products and cattle feed mills etc.⁶¹ However, the dairy sector consists of 150,000-200,000 SMEs that could prove to be the backbone of the sector. They require incentives for investment in the dairy and livestock sectors. The particular areas of support needed by the SMEs in the dairy sector include setting up of model dairy farms, provision of business consultancy services, setting up of semen production units, and establishing dairy zones in each district etc.⁶²

Trade Policy Specific to Dairy Sector

The Strategic Trade Policy Framework 2009-12 presented by the Ministry of Commerce envisaged Pakistan, being the 4th largest milk producing country in the world, to become the future dairy exporter at the global level. It identified that China, with its rising annual demand for dairy products (14% per annum) along with South East Asia and Middle East is likely to become the future demand hub for milk and dairy products.

⁶⁰The Economic Survey of Pakistan 2011-12

⁶¹Livestock and Dairy Development Board and Punjab Board of Investment

⁶²SMEDA

No specific trade policy initiatives were contained in the framework. However it may be noted that Pakistan faces huge competition from other dairy exporting countries due to provision of heavy subsidies to their farmers and Pakistan's inability to comply with international SPS standards for its dairy products in major parts of the world.

Institutional Setup in the Public Sector

Dairy development is mainly concentrated in the public sector including government ministries and attached departments, universities and public sector companies. Valuable contribution has also been extended by the private sector for the development of the dairy sector in Pakistan.

Until 2008, the dairy development initiative was managed by the Ministry of Food, Agriculture and Livestock (MINFAL) at the federal level. However, a separate ministry under the title "Ministry of Livestock and Dairy Development" has been formed which is mainly responsible for preparing and implementing national policy planning, coordination with attached specialized departments in all provinces. The ministry is headed by a Federal Minister (an elected representative) while the provincial departments are headed by a Provincial Secretary and assisted by a Director General.

The Ministry of Industries and Production (MoIP) has also supported the dairy sector by managing key projects in the dairy sector. One of these initiatives includes the setting up of PDDC. The University of Veterinary and Animal Sciences (UVAS) is the only vocational institute which is dedicated to education about the animals and research and training. Amongst the departments providing indirect support to the dairy development initiative, Pakistan Standards and Quality Control Authority (PSQCA) is responsible to regulate food safety standards including those for dairy and dairy products.

Under the Companies Ordinance 1984 several public sector companies have been formed to contribute to the development of the dairy sector. These were formed through financial support from the government and donor agencies. These include PDDC formed in 2006, LDDB formed in 2007, and nine rural development programs.

The main objectives of the PDDC include improving dairy research facilities, training and capacity building of dairy farmers, veterinary training, improvement of the cold chain system, promotion of healthy pasteurized milk, developing model dairy commercial farms, improving breed management, facilitating credit financing to dairy farmers, and linking rural farmers with the markets at the national level.

The objectives of the LDDB include improvement of extension services to dairy farmers, training of extension services personnel, enhancing the research capabilities in priority areas of the dairy sector and enhancing national, provincial and donor linkages.

The federal and provincial governments play a significant role in the development of dairy sector through policy formulation and implementation and provision of support services including veterinary care and training through a nationwide coverage. However, the public sector fails to deliver the required results due to financial and human resources constraints. Further, due to lack of coordination between related agencies and heavy reliance on donor funding that is usually provided to target short term achievements rather than long term development initiatives the public sector has not been able to perform satisfactorily. On the contrary, although the private sector has a well-managed value chain but yet it has paid little attention to make available to the consumers very affordable dairy products by bringing investment in low-cost technologies. That is why the consumers largely rely on basic dairy products including farm fresh milk.

Regulatory Framework in the Dairy Sector

This section provides an overview of the regulatory framework that is relevant to the livestock sector in Pakistan. These include the livestock (i) food safety laws, (ii) trade regulations and (iii) price regulations.

Food Safety

The Pure Food Ordinance, 1960

This ordinance aims to consolidate and amend the available laws in relation to the preparation and marketing of food. All the provinces including some northern territories have adopted this law with a few amendments as per their suitability. The main objective of the law is to counter adulteration in food supplied in the market and ensure its purity.

The law prohibits any person to mix, colour, stain or powder any food. The mixing would therefore be considered a violation of prescribed rules or would likely to make the food injurious for health. The prescribed rules set out standards for colouring, preservatives, flavouring compounds, antioxidants, stabilizers, anti-caking agents, non-nutritive constituents, and metals. The law also prohibits the sale, preparation, manufacturing and import or export of food that is not suitable for human consumption and is treated as injurious to human health.

The law also sets out rules for labelling of pre-packaged food, and precautionary measures to be taken during storage, stocking and packing. Four criteria are adopted by the law to ensure purity of food; (i) it prohibits manufacturing/preparation or processing of food that is likely to be unsafe for human consumption, e.g., any food that can cause food poisoning; (ii) it prohibits import, export or sale of unsafe food; (iii) it sets out hygiene standards; and (iv) it provides for inspection and laboratory analysis of food samples according to set criteria.

Local authorities are designated by the government for enforcement of the ordinance within their jurisdictions. The law is not uniform in all areas and even the penalties for the same offense vary from province to province. The law also does not provide for compensation standards or payment of damages to aggrieved consumers.

Pakistan Hotels and Restaurant Act, 1976

This law applies to all hotels and restaurants in Pakistan and seeks to control and regulate the rates and standard of service(s) by hotels and restaurants. In addition to other provisions, under section 22(2), the sale of food or beverages that are contaminated, not prepared hygienically or served in utensils that are not hygienic or clean is an offense. This law does not specifically mention consumers' right to lodge a complaint. However, this does not prevent any person from addressing a complaint to the controller appointed by the Federal Government for enforcement of the act. Consideration of the complaint is a matter of jurisdiction of the controller. Moreover, as in other food laws, the act does not provide for compensation to consumers in case of damage.

The Pakistan Standards and Quality Control Authority Act, 1996

Although being a relevant law, this law has not been notified as a food law. The Pakistan Standards and Quality Control Authority (PSQCA) Act provides for the establishment of the PSQCA which is the body for formulating standards or adopting international standards. It is also responsible for enforcement of standards in the whole of Pakistan and has the mandate to inspect and test products and services including food items for their quality, specification and characteristics during use and for import and export purposes.

Government Agencies Involved in Food Safety

At the federal level, Ministry of Food Security and Research has been created after the 18th constitutional amendment to ensure food security and growth in the agricultural sector of Pakistan. The ministry also has the mandate to improve food safety at the national level through policy making and implementation of an integrated system of SPS controls at the federal and provincial levels. This project is being undertaken by the NAPHS under the administrative control of the ministry. One of the main outputs is to implement the “National Food Safety, Animal and Plant Health Regulatory Authority Bill” at the federal level through enactment by the parliament at the earliest. However, the ministry is facing problems in implementation of the initiatives as it is newly created.

PSQCA, working under the administrative control of Ministry of Industry and Production is the national standard making organization. It is involved in managing food safety being one of its major objectives aimed towards ensuring health and safety of the public and protecting the consumers of Pakistan. The authority is a member of the International Organization for Standardization (ISO) in Geneva, Switzerland. It aims to ensure the food safety through testing and assessment of raw materials and finished products relating to food items through its testing facilities in all provinces. The authority is established under the Pakistan Standards and Quality Control Authority Act that was enacted in 1996 and is generally not considered a food safety law in the country. To encourage better performance of PSQCA in the field of safety and health, the law should be directly linked to food safety and the organization needs to be given the required manpower and facilities.

The Customs Department, Plant Protection and Quarantine (PPQ) Department, Pakistan Council of Scientific and Industrial Research (PCSIR), National Institute of Health (NIH), Pakistan Agriculture Research Council (PARC) and Pakistan Council for Research in Water Resources (PCRWR) are also contributing towards food safety in the country in accordance with their limited organizational mandates.

At the provincial level, the Punjab Government has recently established Punjab Food Authority (PFA) under the Punjab Food Safety and Standards Act that has taken up food safety functions of the district governments as per previous practice relating to food manufacturing, storage, distribution, sales and imports in the province. The impact of this authority cannot be judged as it was established just a few months ago. However, it is a positive effort of the provincial government towards ensuring a holistic food safety regime. Other provinces are also in the process of establishing such authorities and drafting the relevant legislations.

Pakistan currently lacks an integrated food safety framework and the three laws as mentioned earlier fail to create an impact due to lack of their understanding and weak implementation. Some of the hindrances in the working of the system are; the fundamental differences between objectives and approach towards implementation, unavailability of skilled manpower, lack of appropriate technology and non-optimum use of financial resources.

Dairy Trade Regulations

Import Regulations and Standards

The legislative framework for trade-related food quality and safety in Pakistan is embedded in the Pakistan Pure Food Laws (PFL) of 1963 that covers 104 food items falling in over nine broad categories, including milk and milk products.⁶³ The regulations aim to address purity issues related to raw food and deal with subjects relating to food additives, preservatives, food and synthetic colours, antioxidants and heavy metals. The use of the Harmonized Coding System for classification of goods is made and food labelling and packaging requirements are also enforced.

In general, the food import regulations of Pakistan at the federal level require that if the product is being sold in the exporting country or country of origin of the product, then it must meet the Pakistani food standards as well. Generally the Codex standards and guidelines are used for imported food products. The US Food and Drug Administration (FDA) standards are also employed for certain products. Products

⁶³ Pakistan, Food and Agricultural Import Regulations and Standards – Narrative, USDA FAIRS Country Annual Report 2009,

relating to animals, especially dairy and meat products may only be imported unless these are certified to be “Halal”, i.e. slaughtered in accordance with Islamic laws.

The Customs and the Plant Protection and Quarantine (PPQ) Departments are the two main agencies involved in the regulation of imported food products. The Customs Department’s main function is to ensure that the shelf-life and labelling of imported food products are according to the federal government’s requirements. The basic requirement being that the imported food product should have at least 50% of the remaining original shelf life at the time of importation. This standard is met through correct labelling containing the production and expiration dates. Certain livestock products containing pork or pork products are prohibited/ banned to be imported on religious basis. These along with other banned products are included in the “Negative List” maintained by the federal government. The PPQ’s main function is to ensure that shipments containing live animals meet the phyto-sanitary import requirements.

Import and Export Policy Orders (2009)

According to Clause 5 of the Import Policy Order, 2009, the import of live animals, including sheep, goats, cattle and buffaloes, meat, bone meal and tallow containing protein and feed ingredients are prohibited from Bovine Spongiform Encephalopathy (BSE)⁶⁴ infected countries such as the United Kingdom, Ireland, Belgium, Denmark, Falkland, France, Germany, Italy, Luxembourg, Holland, Spain, Brazil, Czech Republic, Austria, Poland, Slovakia, Slovenia, United States and the Alberta Region of Canada.⁶⁵ The ban is however not applicable to import of feed ingredients such as growth promoters, concentrates, milk enhancers, enzymes and fish meal replacers that have originated from vegetable, poultry, mineral and sea sources from the above mentioned BSE-infected countries.

On the other hand, although the Export Policy Order, 2009 allows export of live animals, the same can be restricted by the federal government as and when needed. Live animals have been included in Schedule II, which is a list of products that can be exported from Pakistan subject to given conditions. These conditions and the required export procedures were implemented by the Ministry of Livestock and Dairy Development but after devolution, the same has been assigned to the Ministry of Commerce.

Both policy orders were formulated and are enforced by the Ministry of Commerce in Pakistan.

Price Regulations

Drawing authority from a federal legislation called the Price Control and Prevention of Profiteering and Hoarding Act, 1977 (PCPPHA), the federal government controls prices of daily life commodities, including milk, through the National Price Control Committees for welfare of the general public, There are sub-committees working under this national level committee operating on district levels that ensure price control in their particular regions.

The domestic dairy market is currently facing a dilemma in which price of milk produced in the informal sector is being regulated by local authorities in the urban markets, whereas no such regulations are applied to prices of packaged milk and dairy products in the formal sector. In case of informal milk production, the designated officials of the local authorities carry out a market survey and then in consultation with the relevant stakeholders the committees fix a selling price of fresh milk in the domestic market. The practice seems to be against the spirit of business competition as laid down in the Competition Act, 2010 and has been facing criticism from concerned stakeholders recently.

The International Food Safety Regime and Domestic Compliance

With increased globalization resulting due to significant rise in international trade in the 1990s, a major trend has emerged in which consumers around the world have become more conscious about the origin of

⁶⁴ Bovine Spongiform Encephalopathy, commonly known as “Mad Cow Disease” which can most easily be transmitted to human beings by eating food contaminated with the brain, spinal cord or digestive tract of infected carcasses.

⁶⁵ Import of meat and meat products from other parts of Canada shall however be allowed subject to certifying additional animal quarantine requirements

the food supplies and associated food safety risks. For this, the process of developing international rules on food safety was accelerated to shape them as multilateral agreements and standards. At present, the Codex Alimentarius Commission (CAC) and the (WTO are two most important organizations covering rules on food safety. The two organizations have presented comprehensive food safety strategies that influence domestic regimes of the countries around the world.

In the forthcoming paragraphs, role and functions of the Codex Alimentarius and the two multilateral agreements of the WTO on SPS and Technical Barriers to Trade (TBT) will be discussed to analyse impact of international rules on food safety.

The Codex Alimentarius

The Codex Alimentarius consists of collection of internationally recognized food safety standards, codes of practice, general guidelines and other recommendations relating to food products and food production. The standards are developed and maintained by a body called the CAC, established by the FAO and the United Nations in 1961, while the World Health Organization (WHO) joined in 1962. The standards are also recognized by the WTO as international benchmark in food safety rules and are used as reference for resolving disputes among the member countries.

The standards cover all types of food including raw, semi-processed or fully processed food which are directly marketed to the consumers. The text contains specific standards on food items including meat products (fresh, frozen, processed meat and poultry), milk and milk products, fish and fisheries (marine, freshwater and aquaculture), food for special dietary requirements (infant formula and baby foods) etc. and general guidelines on matters such as food labelling, food additives, contamination of food, pesticide and veterinary residues in food (maximum residue limits), and food hygiene etc. In addition to the above, the Codex standards also contain recommendations for the governments on how to establish import and export inspection services and a domestic certification system for food products. This implies that the Codex standards are scientifically justified and are accepted as benchmarks against which national measures and regulations on food safety are evaluated.

In international trade, the CAC goes a step further beyond removing barriers to trade. It rather encourages traders to adopt and accept ethical practises voluntarily that protect consumers' health and promote fair trade. The CAC contains a Code of Ethics for International Trade in Food, the general principles of which are stated as following:

- (i) *“International trade in food should be conducted on the principle that all consumers are entitled to safe, sound and wholesome food and to protection from unfair trade practices.”*
- (ii) *“No food should be in international trade which:*
 - (i) *has in it or upon it any substance in an amount which renders it poisonous, harmful or otherwise injurious to health; or*
 - (ii) *consists in whole or in part of any filthy, putrid, rotten, decomposed or diseased substance or foreign matter, or is otherwise unfit for human consumption; or*
 - (iii) *is adulterated; or*
 - (iv) *is labelled, or presented in a manner that is false, misleading or is deceptive; or*
 - (v) *is sold, prepared, packaged, stored or transported for sale under insanitary conditions.”*

The code is currently being updated to reflect the impact of the WTO agreements on SPS and TBT on international trade. The main objective is that exporting countries should be stopped from dumping food products of substandard quality and safety in international markets.

The Agreement on the Application of Sanitary and Phyto-Sanitary Measures (SPS)

The Agreement on Sanitary and Phyto-Sanitary Measures (SPS) came into force with the establishment of the WTO on January 1, 1995. The main objective was to establish international regulations that would ensure supply of 'safe' food, as per appropriate standards, in a way that they may not be used as a means to protect the domestic producers by the member countries. Hence the SPS Agreement sets out basic rules for how countries may enforce their domestic food safety and animal and plant health measures. Nevertheless, these regulations must be based on scientific justifications and the prevailing international standards. Member countries may set higher standards for health safety under the agreement but these rules cannot be enforced arbitrarily between exporting countries where identical or similar conditions prevail. The SPS measures under the agreement are defined as any measures that are used:

- (i) "to protect human or animal life from risks arising from additives, contaminants, toxins or disease-causing organisms in their food;*
- (ii) to protect human life from plant- or animal-carried diseases;*
- (iii) to protect animal or plant life from pests, diseases, or disease-causing organisms;*
- (iv) to prevent or limit other damage to a country from the entry, establishment or spread of pests."*

The SPS agreement covers all food safety and hygiene measures such as control of veterinary residues, pesticide residues and other chemical/food additives used in food production. However, the measures to ensure environmental protection, protection of consumer interest, and the welfare of animals are not covered under this agreement. Specific regulations regarding these can be found in the Agreement on TBT.

The key features of the SPS Agreement are as following:

- i. **Basic Rights and Obligations:** As per Article 2, members have the right to take SPS measures to protect human, animal or plant life which are consistent with those provided in the agreement but which do not arbitrarily discriminate between members having same or similar condition or would serve as a means to unjustifiably restrict trade.
- ii. **Harmonization:** Under Article 3, member countries are encouraged to harmonize their SPS measures to international standards, guidelines and recommendations as much as possible. Higher standards may be applied by member countries but on the basis of scientific justification.
- iii. **Equivalence:** Under Article 4, member countries should recognize and accept the SPS measures of other member countries even if they differ from their own if they can be objectively demonstrated by the exporting country that the measures are appropriate as per the importing country's standards.
- iv. **Adapting to Conditions:** Article 6 takes into account that the local conditions amongst member countries may vary to a large extent, including climatic conditions, existing diseases and pests and food safety conditions, and therefore the same SPS standards cannot be applied at the same level.
- v. **Risk Assessment and Determination of Appropriate Level of SPS Protection:** The agreement through the provisions of Article 5 encourages member countries, while enforcing SPS measures in their domestic regimes, should be as transparent as possible for assessing the risks. In case a member country deems that the SPS measures put in place by another member country are restrictive to trade, the member country maintaining such standards would provide an explanation the necessity for maintaining such levels based on the scientific justification.
- **Transparency:** Under Article 7, the member countries are required to notify changes in their SPS measures which can potentially affect trade relations. The governments are also required to set up offices called "National Enquiry Points" to respond to requests on new or existing SPS measures and they must be open to scrutiny by other member countries as to how they apply their food safety measures for human, animal and plant health.

In view of the above obligation, Pakistan has set up the NAPHIS under the Ministry of National Food Security and Research as the national enquiry point for domestic SPS measures and related issues. It is also the focal point for CAC and the European Union Rapid Alert System for Food and Feed (RASFF). It is envisaged that the organization will be transformed into a statutory regulatory body and would also be the focal point for dissemination of information and issues on TBT.

The Agreement on Technical Barriers to Trade (TBT)

The TBT Agreement recognizes that technical regulations are important for many reasons including consumer safety, environmental protection, and national security. The problem arises with the fact that these regulations vary from country to country that makes trade difficult for producers and exporters. Also if these standards are set arbitrarily, they can make trade restrictive in the disguise of protectionism of domestic industries by member countries. The agreement therefore strives to ensure that these technical regulations, standards, testing and certifications do not create unnecessary barriers to trade. Although it recognizes the member countries' rights to ensure domestic safety and protection, they are encouraged to adhere to international standards and follow the principle of non-discrimination amongst trading partners.

For the sake of clarity, it may be noted that technical regulations and standards include the specific characteristics of a product in terms of its size, shape, design, functionality and performance and these also include the requirements of its labelling and packaging.

The agreement is based on the following objectives:

- a. Protection of human safety and health, examples include equipping motor vehicles with seat belts to minimize injury, labelling of cigarettes which indicate their harmfulness to health.
- b. Protection of animal and plant health and life by water, air and soil pollution so that they do not become extinct.
- c. Protection of the environment that may include recycling of paper and plastic products, levels of carbon emissions etc.
- d. Prevention of deceptive practises by producers that includes provision of complete information regarding the product to consumers in terms of its labelling and packaging requirements, measurements, classification and definition etc.

The key features of the TBT Agreement are discussed as below:

- Preparation, Adoption and Applications of Technical Regulations and Standards: The TBT Agreement under Articles 2, 3 and 4 specifies a code of good practice for governments of member countries and also non-governmental and industrial bodies to prepare, adopt, and apply the voluntary standards. Internationally, over 200 standards-setting bodies apply this code.
- Fair and Equitable Assessment: Article 5 of the agreement specifies that the procedures adopted by member countries which determine the conformity of a product with relevant standards should be fair and equitable and discourage any methods that may provide domestic products with an unfair advantage.
- Mutual Recognition: The agreement encourages member countries to recognize each other's procedures that test the conformity of the product to relevant standards and technical regulations. Without this the product may be tested twice; once in the exporting country and then by the importing country. Article 2.7 also encourages member countries to accept equivalent technical regulations of other members even if these differ from their own if the country feels satisfied that the regulations adequately achieve the objectives of their own regulations.
- Transparency: Article 10 of the agreement binds member countries to set up "National Enquiry Points" to disseminate information regarding domestic technical regulations and standards and to exchange information with other member countries through the WTO procedure of notification of new and existing regulations.

In response to the above obligation, the Pakistan Standards and Quality Control Authority (PSQCA) has been nominated as the national enquiry point on standardization, conformity assessment, legal metrology and technical services. Other than PSQCA, the Pakistan Council of Scientific and Industrial Research (PCSIR) is providing technical testing and quality control services to exporters and is issuing analytical reports/ certifications that are currently being accepted by other countries including the European Union. Exportable food items including milk and milk products are also being tested by PCSIR for microbial contamination and shelf life.

Domestic Compliance of International Standards - The National Animal and Plant Health Inspection Service (NAPHIS)

As discussed earlier, Pakistan lacks a coherent and integrated system for the management of SPS measures, technical regulations and standards. Due to this the country faces frequent restrictions and bans on exports of agricultural and industrial products by other countries.

In view of above, a Public Sector Development Program (PSDP) funded project called the Integrated National Animal and Plant Health Inspection Services (NAPHIS) is being implemented under the newly formulated Ministry of National Food Security and Research. The project titles “Special Program for Strengthening SPS Facilities and Quality Inspection Services in Compliance with WTO - Establishment of an Integrated National Animal and Plant Health Inspection Services (NAPHIS)”. With an estimated budget of PKR 415 million, it is scheduled to be completed by the end of the year 2012. The specific objectives of the project include:⁶⁶

- (i) Capacity building of agricultural line departments for international accreditation;
- (ii) Ensuring compliance of national/international food safety laws for better trade,
- (iii) Developing an integrated SPS Management/ Inspection and Quality Control and Certification system for exports and imports;
- (iv) Coordinating and integrating provincial SPS management systems with that of the federal one;
- (v) To be the focal point for SPS related issues and to establish NAPHIS as the regulatory authority on SPS measures in Pakistan.

NAPHIS is currently coordinating with UNIDO under the TRTA II program to develop a suitable model for integrated food safety and SPS management in Pakistan. It is also operating as a “Think Tank” for technical input on national and international levels for Pakistan.

Environmental Impact of the Dairy Industry

It has been established internationally that the dairy industry has significant direct and indirect impact on the environment. In countries like Pakistan where proper waste management practices are largely ignored, livestock has a direct impact on the environment due to the emission of organic matter, unchecked greenhouse gases, drug and pesticide residues which pollute the water bodies and soil.

As the number of animals in the dairy sector increases (as reflected in Table 2, Section I), the need for feeding them also increases in the same proportion. As grazing is one of the main sources of livestock feed, an increase in its population is putting pressure on the forage grown on lands. In one way this is leading to depletion of land resources due to over-grazing and on the other, it is indirectly increasing competition for feed resources.

In the formal sector, the dairy processing companies are contributing to environmental degradation by polluting the water bodies through liquid waste from washing and cleaning operations and solid waste from

⁶⁶NAPHIS, Ministry of National Food Security and Research

packaging material such as tetrapak cartons. It is interesting to note that the UHT processing causes less air damage through energy emissions whereas pasteurization is a bigger culprit that uses excessive energy during processing, refrigeration and transportation. Hence, there is a need for the government to make a concrete proposal of either encouraging pasteurized milk processing or the UHT mode of milk processing, keeping in view the impact of the both on the environment and welfare of consumers and economy as a whole.

The Pakistan Environmental Protection Act, 1997 requires milk and dairy processing facilities to undergo Initial Environmental Examination (IEE) at the time of commencing construction of the facility⁶⁷ or in case the facility⁶⁸ is likely to have adverse environmental effects, an Environmental Impact Assessment (EIA) is to be carried out by the Environment Protection Agency (EPA). However, compliance to these regulations is very weak in Pakistan. This aspect of the industry has also been ignored in the Livestock and Dairy Development Policy of 2007.

The issue and opportunity of *biogas* generation in the dairy industry has also not be considered or availed seriously. "The Pakistan Domestic Biogas Program" (PDGP) was initiated in January 2009 by the Rural Support Programme with the financial assistance of SNV (Netherlands Development Organization) and under the consultancy of Winrock International. The main objective of the project was to raise the livelihoods of rural farmers and improve their quality of life by establishing a commercially viable biogas sector in Pakistan. The project, having set a target of establishing 14,000 biogas plants by the end of 2012, has not been able to foster its progress and has been able to construct only 70 biogas plants in the first year of its operation. The main reason is the preoccupation of its managers in streamlining its infrastructure, marketing and establishing linkages with various stakeholder organizations which is taking much of its time.⁶⁹

⁶⁷Dairy facility with a total cost of less than Rs. 100 million (SMEDA)

⁶⁸Dairy facility with a total cost of Rs. 100 million and above(SMEDA)

⁶⁹Rural Support Program Network (RSPN), Pakistan Domestic Biogas Program (PDBP), http://rspn.org/our_projects/pdbp.html

SECTION 5: CONCLUSIONS AND RECOMMENDATIONS



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The preceding sections provide an in-depth review of the dairy value chain and supply chain including its strengths and weaknesses. These sections further highlight trade potential of the sector besides discussing relevant governmental policies and regulations relating to the dairy sector in Pakistan.

This section is prepared keeping in view the overall objective of: (i) bringing the major developmental issues in the limelight that the dairy sector is currently facing besides making an assessment of its hidden potential, (ii) initiatives taken by the government and other support organizations in the public and private sector to facilitate the sector at different levels, (iii) assessment of gaps between sector's developmental requirements and support in the shape of policy and implementation by the governments at federal and provincial levels, and (iv) recommend policy and development related initiatives which can be used to bridge gaps and make sector more efficient in fulfilling domestic demands in the first instance and followed by its competitiveness to make inroads into potential export markets. Medium and long term policy initiatives and preparedness by all stakeholders to upgrade present position are considered in this section. For compilation of overall study and mainly to cover its final part, a reasonable number of stakeholders in public and private sectors were consulted. Use of secondary data, wherever required, is also made that mainly includes literature, government records and web based information and other secondary sources.

Organizing Informal Sector – The Dairy Hub Concept

The authors extensive research⁷⁰ and policy reform proposals received through a public private dialogue (PPD) on 'Enhancing Competitiveness and Export Potential of Livestock and Dairy Sector'⁷¹ from various stakeholders have firmly established the urgent need to organize the 83% small-scale, subsistent farmers as the major stakeholders and to institutionalize their representation in the government policies.

The Dairy Hub concept provides an impetus to organize these farmers into clusters or cooperatives based on vertical integration of the dairy supply chain with a focus on provision of livestock development services. The concept finds its background in the largest dairy development program in the private sector; called the Dairy Hub, which has been initiated by Tetra Pak Pakistan and is being implemented through large milk processors such as Nestle, Engro Foods and Haleeb Foods. This community development programme aims at providing training, consultancy and veterinary services to rural dairy farmers on one-herd basis of 20 villages located within a radius of 15-20 km and making up one Dairy Hub.⁷² Some of the initiatives taken under this program on the farm management include provision of mechanized milk machines and on-farm consultancy services by a field service officer posted in the area.⁷³

Workability of the Dairy Hub Concept

It is proposed that the implementation of the Dairy Hub concept could prove to be very effective in organizing the dairy sector of Pakistan through active and coordinated participation of the public sector and dairy processors with a sense of ownership. The rationale is to implement the "one herd-one farm" concept within a pre-determined livestock-concentrated region⁷⁴ focusing on implementing an efficient milk collection and chilling mechanism. It is proposed that the government may define areas at the Divisional level⁷⁵ with 50-60 villages in one hub and extend livestock services such as breed improvement and management, feed and fodder production and provision, veterinary care, extension services, and credit availability in a concentrated manner. The two most positive effects of this concept which can be foreseen are; increased and active participation of the smallholder in community development and the ability of the public sector to assess results of its development initiatives in a transparent and accountable manner.

⁷⁰ Extensive interviews held with public sector organizations including livestock and dairy departments, dairy producers, dairy processors and the academia

⁷¹ The PPD was held as part of the European Union-funded Trade Related Technical Assistance (TRTA II) programme in Pakistan.

⁷² There are currently three dairy hubs operational under this concept established by Engro Foods (2009), Nestle (2009) and Haleeb Foods (2010) and encompassing 16-24 villages in the areas of Kassowal, Mian Chunnun and Chuchak Renala respectively. The hubs have successfully achieved targets in improved average animal yield, establishment of disease-free areas, quality assurance of milk (TPC < 500,000), reduction in production costs, capacity building of farmers and less reliance on the middlemen. (Solve Agri Pak Private Limited)

⁷³ The consultancy for the project was provided by Solve Agri Pak Private Limited, a dairy consultancy based in Lahore.

⁷⁴ The data on livestock and dairy farms in the country is marinated regularly and is currently available with the livestock departments of each province as per the report's findings.

⁷⁵ In the administrative setup of the country, one Division generally comprises of 8-12 Union Councils (UCs) and each UC in turn comprises of 5-6 villages.

The administrative setup of the country comprises of provinces, divisions, districts, tehsils⁷⁶ and Union Councils. According to government sources, there are currently twenty seven (27) divisions in Pakistan. Based upon this information, the establishment of twenty seven (27) Dairy Hubs can be foreseen in all the provinces. The physical infrastructure for public sector veterinary care is already present with at least one veterinary hospital dispensary/ centre in each union council. It is proposed that one extension worker may be employed by the government for two villages and two extension workers should be headed by at least one veterinary doctor. Considering the above, each division would potentially have 32-48 veterinary doctors and 64-96 extension workers; and each union council would have 3-4 veterinary doctors, supervising a total of 6-8 extension workers. The largest hospital amongst the union councils in the division may be established as the headquarters of the dairy hub.

Role of Public Sector

1. The first and foremost role of the Ministry of Food Security through the LDDDB) and PDDC, in coordination with the provincial governments, is to formulate a national level policy for the encouragement of dairy hubs, linking them with the overall developmental policy based upon poverty alleviation. The same needs to be implemented by the provincial governments in a phased manner, preferably starting from pilot projects in fewer divisions to judge the stakeholders' response and success rate.
2. The provincial governments need to make available their existing infrastructure and human resource in veterinary care to be employed as a base for the dairy hub concept. All other existing facilities relating to model farming, feed and fodder provision, extension and financial services need to be concentrated and delegated to the divisional units for proper functioning of the hub. The provincial government's role in the implementation of Dairy Hub should be centred on the establishment of Village Milk Collection Centres (VMCs) and chilling centres. The collection of quality milk from smallholders should be regulated through testing for 13% criteria of Total Solids (TS), TPC, Physical Organo-laptic and butter fat content at the VMCs, which would ensure purchase of quality milk by the dairy processors. A proactive and successful role modelling by government of Punjab in the effective implementation of the concept, having the majority share of livestock and dairy sector of the country, could provide the necessary impetus to other provinces to follow course as well. The provincial government has been internationally recognized by agencies such as the World Bank in initiating effective developmental projects and has been declared as role model government amongst all the provinces.
3. The central factor in the sustainability and acceptance of dairy hubs is the provision of purchase guarantee. The government needs to ensure a minimum support price for the dairy farmers and producers, in case of non-procurement from the private sector.
4. Another crucial role in the sustainability of the project is consistent provision of funds. Although the sectoral development is mandated to the federal government, the financial provisions are to be made by the provinces in view of the 18th amendment. There is a need to seriously lobby the cause of dairy development to international donor agencies currently active in Pakistan and through submission of targeted project proposals.
5. The government needs to play a crucial role in the marketing of investment opportunities to donor agencies in the fields of dairy research, policy reviews, technology, breeding and genetics and enhancing the capacity of the public sector which could further increase effectiveness of the dairy hub concept.
6. The provincial governments should focus on provision of free livestock development/ extension services only rather than free provision of feed, vaccines etc. This would ensure that the smallholders do not develop an over-reliance on these facilities and develop an attitude of hand-holding.
7. Lastly, the government needs to play a regulatory role in terms of breed management and preservation, semen, feed and vaccine quality in coordination with provincial governments for the implementation of the dairy hubs.

⁷⁶Also known as Talukas in Sindh and Sub-divisions in KPK and Baluchistan Provinces

8. The federal government, under Ministry of Food Security and Research and relevant provincial departments should continue its research and development efforts on the government-owned farms to for the larger benefits of the entire dairy sector.

Role of the Private Sector

- a. As has been evident from the international and local experience, the private sector plays a crucial role in the development of any industry through innovation and technology transfer. The formal medium and large dairy processors should be encouraged to take ownership of required investments in veterinary services, feed production, and artificial insemination and particularly in the implementation of milk purchase, sales, transportation and distribution.
- b. The formal dairy processing industry is facing supply chain constraints in acquiring the required produce due to geographical dispersion as well as quality issues. Through the implementation of dairy hubs, the private sector would benefit greatly from a consistent supply of quality milk. This aspect of the hub operations would ensure increased participation and ownership by the formal dairy processors.
- c. Since the private sector is strongly connected to market dynamics on the domestic as well as the international front, the initiative to develop and implement improved livestock services and dairy hub mechanisms can be effectively marketed by it to other stakeholders.
- d. As investment and financial support from international donor agencies remains unpredictable in view of prevailing socio-economic and political conditions of the country, the private sector's participation should be enhanced gradually over a period of time in view of undertaking profitable meat production enterprises.

Keeping in view various issues identified in dairy supply chain management and trade potential and regulatory framework, the forthcoming recommendations are being proposed to overcome the obstacle to dairy development. These recommendations have been formulated in consultation with all the relevant stakeholders and are also based upon the preceding rationale for the Dairy Hub concept. These are also prepared after foreseeing the participation of dairy farmers and producers and anticipated roles of the public and private sectors and the civil society.

The Dairy Value Chain and Supply Side Constraints

Farm Management and Productivity

Issues

In Pakistan, farming of dairy and dairy products is mainly done on subsistent level. This activity is generally considered by farmers as an alternate source of generating income in case of crop failures. This approach has resulted into uneconomical utilization of resources mainly including underutilization of agricultural land⁷⁷, primitive farming techniques⁷⁸, limited commercial and market orientation, inefficiency of labour force⁷⁹, limited flows of investment in the dairy sector, and low per animal productivity.

There are many opportunities that are lost due to inappropriate farm management mainly including production and utilization of by-products that can indirectly be helpful for sustainability of sector itself. By-products such as animal hair, bones, skins, guts and casings etc. are wasted during slaughtering operations as well as at the time of disposal which results into diminished value of their trade opportunities. Other opportunities that are not fully availed include possibility of producing biogas in the formal and informal dairy sectors, to serve as a substituent to the deficient and much expensive energy reserves procured from thermal operations under the prevailing economic conditions.

⁷⁷ Punjab Livestock and Dairy Development Board (PLDDB)

⁷⁸ Punjab Livestock and Dairy Development Department (PLDDD)

⁷⁹ Nestle Pakistan

As has been discussed in the introductory part of this study, more than 80% of the farms in the dairy sector are owned by smallholders having less than five animals and making up to more than 50% of total *milch* animals in Pakistan (mainly cows and buffalos). These smallholders are mostly landless farmers who are geographically dispersed in various parts of the country. This makes outreach of the government's facilitation institutions much difficult and uneconomical.

Measures Adopted

1. Through the 18th constitutional amendment, agriculture has been devolved to the provinces from a federal subject to the provincial subject with an overall objective to give provinces more autonomy in policies and actions. Federal government is now responsible for making national policy on livestock and dairy.
2. In 2007, a private sector-led initiative was taken where PDDC was incorporated with the objective of facilitating the farmers in dairy sector to improve farm management, enhance productivity, and earn reasonable income for their livelihood. The objective is being pursued through various projects under PDDC in community farming, rural farm services, extension services, model farming program, cooling tank systems, and research and publication ("MaveshiNama").
3. The largest dairy development program in the private sector has been initiated by Tetra Pak Pakistan and is called the "Dairy Hub" 80 and is being implemented through large milk processors such as Nestle, Engro Foods and Haleeb Foods. This community development programme aims at providing training, consultancy and veterinary services to rural dairy farmers on one-herd basis of 20 villages, located within the radius of 15-20 km and making up one Dairy Hub. Some of the initiatives taken under this program on the farm management include provision of mechanized milk machines and on-farm consultancy services by a field service officer posted in the area.
4. International agencies such as the USAID have earmarked funds of US\$ 2.4 million under the Dairy Program 2011-14. The aim is to increase the productivity of 12,000 small-scale farmers in the provinces of Punjab, Sindh and KPK by 15-20% through adoption of better farm management techniques.
5. "The Pakistan Domestic Biogas Program" (PDGP) was initiated in January 2009 by the Rural Support Programme with the financial assistance of SNV (Netherlands Development Organization) and under the consultancy of Winrock International. The main objective of the project is to raise the livelihoods of rural farmers and improve their quality of life by establishing a commercially viable biogas sector in Pakistan.

Impact Assessment

As almost 95% of the dairy community is based in remote rural areas, the major issue with effective implementation of the abovementioned initiatives is their outreach and acceptance by the farmers' communities. The initiatives are generally found unable to benefit a larger percentage of farmers due to poor infrastructure, financial constraints, and access to opinion leaders in various farmers' communities. Often, there occurs overlapping in different initiatives of similar nature that are either initiated by government sector or by certain international or domestic organizations. The major reason is lack of coordination.

The PDGP set a target of establishing 14,000 biogas plants by the end of 2012; however it has only been able to construct 70 biogas plants to date. The main reason is preoccupation of its managers in streamlining its infrastructure, marketing and establishing linkages with various stakeholder organizations, which is taking much of its time.⁸¹

Recommendations

- i. The provincial governments urgently need to establish model farms in the dairy concentrated areas of Pakistan preferably replicating the Dairy Hub concept provided by Tetra Pak.*

⁸¹Rural Support Program Network (RSPN), Pakistan Domestic Biogas Program (PDBP), http://rspn.org/our_projects/pdbp.html

- ii. *The cooperative farming system is the only solution to organizing and formalizing the livestock sector. These cooperatives need to be established at the Union Council (UCs, consisting of 5-6 villages) or Divisional levels (consisting of 10 UCs) which can address the basic issues of the small scale farmers through livestock services, technology and financial assistance.⁸² The successful cooperative movement in the dairy industries of India and Turkey can be modelled for revamping the domestic industry⁸³*
- iii. *A consortium of public, private and donor organizations is required to be established. The terms of such arrangements may be drafted as per stakeholders' requirements and satisfaction.*
- iv. *It may duly be noted that feasibility studies and current experience of entrepreneurs in the dairy sector, it has been determined that this sector can provide between 16-19% in profit margins and Return on Investment (ROI) as compared with the prevalent rate of 3-4% in other business enterprises. This shows that dairy farming and production can be a very profitable business venture for new investors.⁸⁴*
- v. *Government owned livestock farms should not be privatized as they are specifically carrying out research and development (R&D) and are acting as hubs in preserving precious genomes of livestock breeds.⁸⁵*
- vi. *Successful implementation of the project for the production of biogas on commercial basis requires ownership and commitment between the public and private sector and for acquiring technological expertise. Provincial and federal governments may seek assistance from the private sector⁸⁶ in maximizing the impact of the programme and also prepare some model biogas plants that can be used as success stories for the farmers. Again, media campaigns and use of information technology can be effective means of approaching the target audience. The initiative could be the potential solution to the energy crises plaguing the country at the moment. Once the value of this resource is realized at the national level, only then its value can be translated to the dairy and livestock farmers.*
- vii. *The biogas and bio slurry production can be successfully implemented in the dairy hubs at least at the household levels. It is estimated that 1 kg dung can produce up to 1 cubic meter biogas. At least 10 animals are required to produce the required level of bio waste which could result in the production of 15 cubic meters a day to run a small household. The estimated cost of production is PKR 60,000-65,000.⁸⁷*

Training and Awareness of Stakeholders

Issue

During the consultation process with the selected sample of stakeholders in public and private sector, approximately 90% of them ascribed "awareness" as one of the major obstacles in smooth execution of various government-led and private sector's initiatives undertaken for the uplift of rural farm based community and improving their competitiveness. The awareness issue is not only in the farmers' community but it applies on the workers and staffs of government run organizations. In Punjab and Sindh provinces, government uses media to launch awareness campaigns on various projects initiated in the

⁸² Arid Agriculture University, Rawalpindi; Department of Commerce, Industries and Investment, Government of Punjab; Directorate General (Extension Services), Department of Livestock, Government of Punjab, Lahore University of Management Sciences (LUMS)

⁸³ Through concerted efforts, even if milk productivity can be increased by 1 litre/ animal only, Pakistan can potentially become the largest milk producer in the world. (Industry estimates)

⁸⁴ SMEDA

⁸⁵ Arid Agriculture University, Rawalpindi

⁸⁶ Most of the private companies in dairy business, especially the milk processing units can be helpful in fostering the progress of the biogas initiative due to the fact that they have large milk collection networks and these companies are connected with a large number of farmers who are providing milk to the collection centres.

⁸⁷ Solve Agri Pak (Private) Limited

agriculture sector including livestock and dairy. The outreach programme attains partial success mainly due to the above reason despite maximum efforts made by the policy makers.

As discussed earlier, dairy and livestock farming is usually treated by the subsistent farmer community as a secondary source of income after the crop sector. This is one of the main reasons for the sluggish progress in the dairy sector since these farmers constitute a bigger proportion of milk production and they apply unhygienic and traditional methods of milking and processing by products. Lack of awareness on part of farmer community can be divided into four major areas including; (i) knowledge of potential and profitability of dairy farming as a commercial business, (ii) efficient farm practices that can improve productivity and produce excess milk, (iii) awareness of feed availability and nutritional values required for a *milch* animal to produce additional litres of milk, (iv) awareness on hygiene, quality control and veterinary care matters, (v) knowledge about different breeds and their development through insemination and effective use of appropriate bulls for semen transfer to obtain high fertility, (vi) knowledge of available and potential milk marketing channels that can enhance profitability and welfare of the farmers at large.

The work force of provincial government employed to assist farmer communities also lacks necessary advanced knowledge and in the absence of a proper monitoring and evaluation mechanism, appropriate results are not obtained.

Measures Adopted

- a) To create awareness on modern farm management including best business practices and adoption of technology, an extension programme has been initiated under supervision of PDDC. The extension programme aims at providing vocational training to the master trainers and experts in dairy development. Regular field trips are also arranged to familiarize the trainers with the real issues and find solutions to the problems through appropriate management and technical measures.
- b) The Australian Government, under AUSAID, has also completed Phase One of the Agricultural Sector Linkages Program (ASLP, 2011-14) dairy project called “**Improving Dairy Production in Pakistan through Improved Extension Services**” and has now started Phase Two of the project. The project focuses on adoption of effective extension services to improve profitability of dairy farming through capacity building of the rural farmers and industry personnel.⁸⁸
- c) The dairy development programme initiated by the USAID also aims at initiating awareness campaigns for a two million targeted farmer community across the country and provide knowledge on the best farm practices that would ensure high productivity and establishing effective marketing channels. The campaign is likely to last till end of year 2014.⁸⁹
- d) Routine training programmes are organized by the private dairy enterprises such as Nestle and the University of Veterinary and Animal Sciences (UVAS).

Impact Assessment

Till March 2011, under the Extension Program by PDDC, about 100 master trainers and approximately 3,520 dairy farmers have been trained throughout the country.⁹⁰

The USAID Dairy Project claims to have trained 800 dairy farmers across the country with 24 trainers including women livestock workers who are currently working with farmers in more than 100 villages.⁹¹

In a pilot program designed and implemented for 250 farmers under the Agricultural Sector Linkages Program (ASLP), more than 30% of the participants made very simple alterations to their farming practices such as providing free access to water to their animals throughout the day. Such awareness alone has enabled the farmers to enhance daily per animal milk productivity by a minimum of 1.5 litres. Capacity

⁸⁸ Australian Centre for International Agricultural Research, Australia Pakistan Agriculture Sector Linkages Program - Dairy Sector, <http://aci-ar.gov.au/project/LPS/2010/007>

⁸⁹ USAID Pakistan, Economic Growth and Agriculture, Dairy Project

⁹⁰ Pakistan Dairy Development Company

⁹¹ USAID Pakistan, Economic Growth and Agriculture, Dairy Project

building on feed management, cow health and reproductive management was able to provide enhanced income up to Pak Rupees 10,000 or AUS\$ 100 per year in some cases.⁹²

Although these projects seem to have brought positive results, however, the outreach of these initiatives has been found to be much lower considering the fact that more than 8 million geographically dispersed rural based farmers require such active support. The proportion of trained staff and farmers is very low as against the total farmers' population size. These programmes, however, have been initiated very recently and therefore it would need long term policy measures to approach such a large target group of farmers. However, it is pertinent to mention that most of the projects conceived for dairy development are facing sustainability issues due to non-availability of appropriate funds to continue. Therefore the impact of initiatives remains quite low and below desirable limits.

Recommendations

- a. *Efforts are required to be made to enhance outreach through involving opinion leaders and assigning greater responsibilities to the heads of villages and **Panchayats**.*⁹³
- b. *Training programmes for the government functionaries are also required to be conducted. These workers should be chosen from the village communities and after training they should be posted in their own vicinities by assigning targets. A monitoring and evaluation system should be established to oversee the progress and offer rewards and reprisals to the workers. These training programmes can also be conducted with the help of existing government and private sector vocational institutions. This will ensure appropriate and cost effective use of available resources and also build capacity of these training institutions.*
- c. *Federal Government on the national level can involve certain donor agencies to launch a National Awareness programme through media and other intermediate means (also including local cable networks, cellular service providers⁹⁴ etc.) and therefore can assist the provinces in fostering their efforts. The financial constraints can be reduced by involving media, private sector, and donor organizations as media partners.*
- d. *The government must encourage farmers/ entrepreneurs in the country through its various business support organizations, such as LDDB, PDDC and SMEDA to undertake dairy farming as a primary source of income besides crop sector. A shift in the mind-set has to be created in the farmer community so that they consider their animals as a potential and valuable investment with financial return rather than a social capital and insurance in times of financial crunch.*
- e. *Awareness campaigns on development of the dairy sector must primarily be spearheaded by the government primarily rather than merely by the private sector or international agencies since these have their own limitations and capacity constraints when it comes to infrastructure and contacting with target farmers' groups. Government may initiate joint ventures with these organizations and with the media to develop effective outreach themes for attracting the target groups effectively. Awareness campaigns and trainings can be organized with the support of trained extension workers and veterinarians in the proposed dairy hubs at the divisional and union council levels to ensure maximum contact with the farmers.*
- f. *Currently there are six agriculture universities with a number of campuses are operation in Pakistan⁹⁵ that are responsible for providing vocational education on the livestock and dairy*

⁹² Australian Centre for International Agricultural Research, Australia Pakistan Agriculture Sector Linkages Program - Dairy Sector, <http://aci-ar.gov.au/project/LPS/2010/007>

⁹³ Local system of resolving disputes through involving elders of a village who form a committee for the purpose. These Panchayats are headed by Panch whose decision is considered final and is followed in letter and spirit by the whole village. The Panch can also be approached and used for implementation of various initiatives in the dairy sector.

⁹⁴ Awareness through prerecorded advises can be delivered to the residents of rural as well as urban and peri-urban farmers. The assistance of National Database Registration Authority (NADRA) can also be used to identify target audience.

⁹⁵ The Universities include (i) KPK Agriculture University, Peshawar (Faculty of Animal Husbandry & Veterinary Sciences), (ii) Lasbela University of Agriculture, Water & Marine Sciences (LUAWMS) at Lasbela (Faculty of Veterinary and Animal Sciences), (iii) University of Agriculture, Faisalabad (UAF) (Institute of Animal Nutrition & Feed Technology), (iv) PirMehar Ali Shah Arid Agriculture University,

development in Pakistan. Considering the fact that there is insufficient human resource on the veterinary side as against the whole livestock and dairy sector, there is an urgent requirement to establish more campuses of these universities with advanced curriculum prepared in line with international standards. The curriculum should also include ample information on the domestic and international regulatory regimes and requirements for development of the livestock and dairy sector especially when these products are considered for exports. These vocational institutions and universities can be established under public-private partnership initiative at the divisional level and preferably these should be affiliated with international universities of repute so as to attach privilege to these institutions. These institutions can also help in establishing research centres for the livestock and dairy sector in Pakistan.

Animal Management and Welfare

Some of the major issues in the dairy sector include inefficient local breed preservation and development which results into loss of appropriate breeds of Pakistan's local milch species such as Sahiwal Cow, Nili Ravi Buffalo and Cholistani Cow as these breeds are cross bred with exotic breeds. Other allied issues include inadequate supply of water and improper feed with low nutritional values due to limited awareness as well as low investment in the quality fodder followed by seasonal fluctuations in feed supplies.⁹⁶ The issue is further aggravated as a result of inaccessibility to appropriate and affordable veterinary care. The average dairy farmer in Pakistan holding of less than five animals is usually caught up in a vicious circle where his low yielding animals do not offer him any incentive to invest in high quality nutritious feed and medicines and which resultantly further deteriorate productivity of his herd.⁹⁷

Measures Adopted

Breed Preservation and Management

- i. The soon-to-be operational "Centre of Excellence for Development of Sahiwal and Exotic Breeds (CEDSEB)" in the Sargodha district of Punjab under Punjab Livestock and Dairy Development Board (PLDDB) claims to be a state-of-the-art semen production unit. It aims at producing one million semen doses annually⁹⁸. One similar project is under consideration in the Sindh province to cater to the requirements of local breeds in the area.
- ii. Currently two research institutions under PLDDD namely the Research Centre for Conservation of Sahiwal Cattle (RCCSC) and Buffalo Research Institute (BRI) have been respectively established at Jhang and Kasur in Punjab. The latter has been operational since 2005.
- iii. Progeny Testing Programs have been started by PLDDD at Patoki, Haroonabad and Chak Katora in the Punjab province as well.⁹⁹
- iv. One national level project on breed management and reproductive efficiency has been initiated by the LDDB. The project titles "Improving Reproductive Efficiency of Cattle and Buffaloes in Smallholder Production Systems". The program mainly aims at setting up semen production units in the country while building provincial and private sector capacity and offer embryo transfer technology through its facility in Okara, Punjab. The private sector is not largely involved in semen production but some companies import and supply these doses to large commercial farms in Pakistan.
- v. A similar project has been launched in the province of Baluchistan under the title "Promotion of Livestock Farming in Baluchistan" by LDDB.

Rawalpindi (Department of Livestock Production and Management), Sindh, (v) Sindh Agriculture University, Tandojam (Department of Livestock Management), Sindh, (vi) University of Veterinary and Animal Sciences (UVAS), Lahore, Punjab.

⁹⁶ Due to seasonal shortage and poor nutritional value of fodder there is huge gap in demand and supply. It is estimated that feed requirement of animals in Punjab is about 40 million tonnes while production is only 0.2 million metric tonnes. Moreover, nutritional value of fodder is insufficient to boost milk and meat in the animal. (PLDDD)

⁹⁷ Pakistani Cattle and Buffaloes produce an average of 4-5 liters milk per day during the total lactation period of 305 days (SMEDA)

⁹⁸ Currently the imported semen dose costs Rs 10,000 or US\$ 9 whereas the semen production unit, after its commencement, would be able to offer semen dose for as low as Rs 100 or US\$ 0.95 per dose thus reducing the cost by a substantial amount.

⁹⁹ Punjab Livestock and Dairy Development Board (PLDDB)

- vi. To regulate the quality of the semen doses being provided in the market, the government of Punjab has taken initiative and has drafted laws such as the “Semen Regulatory Act” and the “Breed Control Act”. To encourage high yield breeding, the federal government has zero-rated the import of live animals.
- vii. The dairy projects undertaken by ASLP and USAID focus on the capacity building for artificial insemination and breed improvement.

Feed and Nutrition Management

- a) The LDDDB has initiated a major project to increase milk production in Pakistan. Under this project, dairy farmers in 500 identified villages would be provided high quality fodder for the purpose of improving animal nutrition.
- b) For preserving animal feed, technical training programmes have been started by PDDC.
- c) The Silage Project has been initiated by PLDDDB and the Belgian Blue Cattle Farms Pakistan Limited.
- d) PLDDDB has also established Animal Nutritional Centre in Lahore along with a project to supply “Anmol Wanda” to dairy farmers in Punjab.¹⁰⁰
- e) To regulate the quality and provision of animal feed in Punjab, the Feed Control Act is also in the process of being implemented in the province.
- f) The government has also zero-rated the import of fodder and certain feed concentrates.¹⁰¹
- g) In the Dairy Hub program, conceptualized by Tetra Pak and implemented in partnership with large dairy processors, provision of quality silage feed including forage/ roughage and concentrates is being ensured to the farmers throughout the year.

Trainings are also provided on nutrient rich feed production and storage techniques.¹⁰²

Veterinary Support and Animal Health

1. Provincial governments mainly carry out veterinary service and related activities. As explained in Section 2 above, there are 963 veterinary hospitals, 2869 veterinary dispensaries and 2875 veterinary centres in Pakistan.
2. Animal quarantine and drug and vaccine regulations are done at the federal level by the Animal Quarantine Department and the National Veterinary Laboratories, Islamabad, respectively. Vaccine production mainly is the mandate of the public sector. However a few private companies have emerged in this business that is regulated by the Drug Regulatory Authority of Pakistan (DRAP).
3. Currently there are no disease control action plans at the national level. However, the LDDDB has planned to launch a nationwide project called the “Development of Strategy and Implementation Plan for the Progressive Control of Foot and Mouth Disease in Pakistan” in the near future.

Impact Assessment

Breed Preservation and Management

It has been observed that the government initiatives are more focused on capacity building to improve farming techniques, rather than addressing the root causes of low productivity in which breed management is a huge factor. Currently only one government project is operational under the LDDDB on breed

¹⁰⁰Anmol Wanda is a special type of feed concentrate.

¹⁰¹Economic Survey of Pakistan 2011-12

¹⁰²Tetra Pak Pakistan

improvement. The government has therefore been criticised for not being able to deal with this urgent issue.¹⁰³

Imported semen doses become very expensive for the private sector, ranging from PKR 10,000 to 12,000 each. Furthermore, the absence of appropriate domestic regulations has encouraged the production of substandard semen doses by the private sector.¹⁰⁴ Artificial Insemination (AI) technicians are insufficient. Due to financial limitations, against a requirement of employing 16,000 trained personnel, only 900 paid employees and 3,000 self-employed people are presently working in the PLDDB's programme.

There is also a capacity building issue for the stakeholders in semen freezing, artificial insemination and embryo transfer¹⁰⁵. The Dairy Project under the USAID has been able to train 170 technicians Artificial Insemination technique with 100% self-employment after successful conclusion of the training. However, the aim is to train 2,000 technicians in this field and establish them as small entrepreneurs by 2014.¹⁰⁶

Feed and Nutritional Management

Although the federal and provincial government and the private sector as well as the donor agencies have started various initiatives on feed and nutrition management for the farmers, the impact of these initiatives still remains very low. There exist large gaps between the supply of appropriate fodder and its demand in the country.

Veterinary Support and Animal Health

The absence of an appropriate national policy in veterinary support and animal healthcare has resulted into overall deterioration of veterinary services in Pakistan. Despite presence of infrastructure for these services in the country, there are limitations as to the quality and outreach of service providers in this field considering the fact that at least 8 million small, medium and large farmers have to be approached.

Apart from farmers' lack of awareness of the importance of veterinary matters and the issues of limited resources hindering the service providers to reach to such a large number of farmers, a major issue remains that the healthcare staff is not appropriately trained. There is shortage of trained personnel in this field also that is yet another barrier on appropriate service delivery to the target group. These are not only some major impediments in enhancing livestock production in the country but also restrict export opportunities of value added products from Pakistan.

Recommendations

Breed Preservation and Management

- (i) *There is a general consensus amongst the stakeholders that efforts need to be made on the national level to preserve the local breeds.¹⁰⁷*
- (ii) *Up-gradation of the genetic potential of indigenous breeds like Sahiwal Cattle, Cholistani Cattle and Nili-Ravi Buffalo¹⁰⁸ needs to be focused on by the government as these have the most superior germplasm. A lack of awareness regarding breed management is the biggest issue that needs to be tackled at the grass roots level to ensure that good bulls are bred through appropriate feed and nutrition to produce healthier and superior off-springs.¹⁰⁹ This strategy needs a long-term and continuous planning and implementation to counter the negative attitudes and lack of responsiveness amongst the local farmers.¹¹⁰*
- (iii) *Government projects like the CEDSEB are currently facing financial constraints due to lack of public funds. It is proposed that private sector competition as well as joint ventures with internationally renowned companies should be introduced in the project to ensure its early*

¹⁰³Nestle Pakistan

¹⁰⁴ Availability of semen doses in Punjab is a big issue. Punjab's annual requirement of semen doses is 8 million, whereas only 2 million doses are produced leaving a deficiency of 75%. (PLDDB)

¹⁰⁵ Punjab Livestock and Dairy Development Board (PLDDB)

¹⁰⁶ USAID Pakistan, Economic Growth and Agriculture, Dairy Project, http://transition.usaid.gov/pk/db/sectors/growth/project_20.html

¹⁰⁷ Department of Industries, Commerce and Investment, Government of Punjab

¹⁰⁸ These breeds have the capacity to produce up to 30-40 liters of milk per animal on average during a lactation period

¹⁰⁹ Punjab Livestock and Dairy Development Board (PLDDB)

¹¹⁰ It should be noted that, as discussed above, farming and rearing practices amongst the local farmers are mainly based upon traditional knowledge and experience and therefore a majority of them resist in changing their attitude towards improvement.

completion and for the provision of high quality semen doses.¹¹¹ This initiative can potentially lead to the export of semen doses as there is demand for indigenous breed in the international markets as per industry and governmental sources.

Feed and Nutritional Management

- (i) *Currently imported feed prices are quite low as compared to the ones locally produced. According to industry estimates, 1 kg of imported corn feed costs PKR 20 (USD 0.2) as compared to local corn feed at PKR 30 (USD 0.2). This price difference makes a huge impact on the small-scale farmer.¹¹² Therefore the government should continue its policy of opening up imports of all required types of feed and zero-rate them as much as possible.¹¹³*
- (ii) *To cater to the large domestic demand of animals feed and fodder and to decrease the price of high quality concentrates produced locally, the government needs to encourage private investment in this industry. There is high potential to earn profits by the private sector in silage production due to increased efficiency as even the government is earning profits on its silage production project.¹¹⁴*
- (iii) *Simultaneously, the spreading of awareness amongst the farmers' community is an important aspect of making them realize the importance of providing nutritional values to the milch animals and in order to get more production from them and therefore become commercially and economically better off.¹¹⁵ The same can be ensured in the dairy hubs through the provision of low-cost technology, silage production training and imparting relevant knowledge to the opinion leaders and progressive-minded farmers in the villages.¹¹⁶*
- (iv) *As value of land is very high, government may lease land on reasonable rates to farmers interested in growing crop for fodder. Based on the huge gap in the demand and supply of feed, there is a very profitable opportunity for competition in the industry.*
- (v) *A national strategy is required to be adopted where awareness programmes should be launched for the farmers on the importance of food and nutrition according the Total Mixed Ration (TMR) technique.¹¹⁷*
- (vi) *The root cause of lack of proper feed and nutrition and water supplies provided by small-scale farmers is their unawareness of its impact on the animal welfare. These can only be overcome through model practises in the dairy hubs. For example, the acceptability of silage production and provision was very low amongst the small-scale farmers, however, under the Dairy Hub concept by Tetra Pak, when farmers were made aware of the nature of feed, methods of its production, and consequential benefits of increasing their animals' productivity motivated them to use silage instantly. In another incidence, when farmers were taught the importance of keeping their animals loose to reach available water sources on their own and as per their natural requirement, its adoption resulted in an instant increase in the milk productivity of their animals by 1 litre each.¹¹⁸*

¹¹¹ Punjab Livestock and Dairy Development Board (PLDDB) and Punjab Board of Investment and Trade (PBIT) would be required to take a proactive role in this aspect.

¹¹² According to government estimates, about 25 kg of silage is required to fulfil the daily dietary requirements of 1 mature milch animal

¹¹³ SMEDA

¹¹⁴ The cost of production of 1 kg currently stands at PKR 5, while it is being priced at PKR 6.5 (Corn Silage) and PKR 7 (Wheat Silage) to cater to the local farmers, especially when there is a shortage in local fodder production during the winter months. The costs do not include depreciation on the imported machinery and the profits are being reinvested into the project. (Source: Punjab Livestock and Dairy Development Board (PLDDB))

¹¹⁵ Local farmers generally provide low cost wheat straw to their animals which has very low nutritive value and a subsequent negative effect on their productivity levels. (Small and Medium Enterprises Development Authority, SMEDA and Punjab Livestock and Dairy Development Board, PLDDB)

¹¹⁷ TMR ensures that the daily feed quantity provided to the animal should be 3-3.5% of its weight to acquire maximum productivity.

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- (vii) *The animal health needs to be linked directly to public health and this concept has to be inculcated in the minds of the dairy farmers and producers to raise the significance of proper veterinary care and animal welfare. If the concept can be streamlined into the general veterinary policy of the country, the same can be used as an effective marketing tool in trade with the partner countries. The cause needs to be championed by the Ministry of Food Security and Research and the relevant provincial departments and needs to be projected to the local farmers and consumers.*

Veterinary Support and Animal Health

- (i) *National and provincial level government should activate its available infrastructure. There are a number of animal healthcare hospitals in the country whose effectiveness is far below the required levels. Human resource hiring policy for these hospitals and veterinary care centre has to be ensured with preference to the local inhabitants so that their interest in posting at their home stations should be used as a motivational tool to retain them for provision of quality service to the stakeholders.*
- (ii) *The extension workers and veterinary specialists posted at various divisions should be compensated against the level of their performance. This method would provide monetary incentive to increase their veterinary outreach efforts. It is proposed that a bonus may be awarded to those officials having the lowest disease incidence rate in their respective hubs.*
- (iii) *Use of resources of local Panchayat and Daira¹¹⁹ facilities of local village heads can be used while appropriate trained personnel from within the local community can be posted as veterinary attendants under the supervision of the village heads. UC centres under the divisional hub headquarters at union council levels should be established, which can monitor the performance of these medical attendants and also can provide medicines to them. This effort will greatly facilitate healthcare efforts in the farmers' communities and enhance the outreach to the nooks and corners of the country.*
- (iv) *As suggested above, there is urgent need to form veterinary training institutes and universities in the country to overcome the dearth of trained medical staff in the veterinary field. This requires medium and long term strategy. The government should form veterinary academies in major Tehsils as a first step and afterwards may form colleges and universities to overcome a shortage of trained medical professionals. Again, a consortium of medium and large farmers as well as international agencies with the local governments would greatly facilitate this effort.*

Trade Potential of Dairy Products

Generating Exportable Surplus

As discussed above, whilst Pakistan is the fourth largest milk producer in the world, it has not been able to use its comparative advantage in the milk production to explore trade opportunities in this sector. Largely the sector encounters issues relating to productivity, integration of value chain to produce value added dairy products, awareness on enhancing productivity and healthcare, compliance to domestic regulations and international standards, and above all generating exportable surplus that can earn better value for money that the stakeholders put into the dairy and ancillary industries.

The geographic dispersal of the milk producers and many other factors explained in the preceding sections make the task difficult for the policy makers when it comes to the question of exporting milk and dairy

¹¹⁹ These are usually formed by the medium and large size farmers in their agricultural lands. These Dairas are also used as guest houses for guests coming from outside. Storage of grains and other agriculture implements is also done here. Besides, in almost all Dairas, the farmers also house certain animals including cows, bulls, dogs etc.

products to potential export markets in the world. These aspects are followed by the lax approach of farmers for which the majority of them is least interested in adopting modern practices of feed and breed management and due to adoption of traditional milk production and distribution practices they lose a reasonable quantity of milk that could be added to the national production and help in generating exportable surplus.

Investment in the downstream as well as upstream dairy industry has also remained a major obstacle in its overall development. The investment levels in dairy have remained very low despite its importance as a cash income generating business activity. There is an urgent requirement for investment in the value added and ancillary industry in the dairy sector which can uplift its commercial as well as economic conditions as the sector offers appropriate returns on investment and is now being considered as a high return business if compared with the other businesses in the country that carry higher levels of difficulty, risk, and tight returns on investment.

Measures Adopted

Although the Strategic Trade Policy Framework (STPF) 2009-12 recognizes the future potential of the dairy sector on the basis of sustainable increase in dairy production and having potential to contribute in the export drive of the government. However, no specific initiatives relating to the dairy sector were made part of the STPF.

Impact Assessment

In the absence of export related initiatives, the assessment of impact cannot be made.

Recommendations

Trade is mainly dependant on the supply position of a domestic quantity in addition to meeting customers and regulatory requirements of the international markets. Certain recommendations are given below on enhancing the opportunities to increase production of milk and make it available for the value added industry for export purposes. Government may take appropriate measures to increase milk production and generate surplus.

- (i) Federal government, can utilize the Trade Development Authority of Pakistan (TDAP) (the countries only trade promotion organization) to conduct awareness seminars in various parts of the country with the collaboration of local chambers of commerce, dairy traders and exporter associations, PDDB, USAID, and other related organizations mainly for the awareness of the farmers to produce quality surplus through use of appropriate milking techniques that could ensure less wastages and improved hygiene standards. These farmers should also be made aware of adopting appropriate supply chains so that they are not exploited by local milkmen and big suppliers.*
- (ii) The value added industry producing dairy products such as cheese, butter, condensed milk and other related products should be educated on quality matters as well as on benefits of adopting hygiene standards which make them internationally compliant. For this, awareness seminars should be held in major cities of Pakistan by TDAP, local chambers and associations and associated organizations.*

Standardization, Compliance and Traceability Issues

The Agreement on Sanitary and Phyto-sanitary Standards (SPS Agreement) of the WTO allows the member countries to adopt certain standards to protect animal, plant and human life from possible threats that can be posed by importation of substandard products from partner countries. The main objective is to ensure compliance with the recognized international standards, increase transparency and reduce protectionist tendencies among the member countries of the WTO in domestic production and specifically in the export of livestock products.

The three food safety laws as explained in Section 3 above loosely form domestic regulatory framework. These do not appear to be in conformance with the international standards in terms of quality standards

and product origins and these are poorly implemented thus resulting into production of products that are not up to desired standards.

The livestock sector faces the issue of traceability which is one of the major requirements of European markets and therefore restricts trade opportunities for Pakistani livestock products. There is usually no maintenance of pedigree record or tagging of the farm animal and there exists no regulatory framework to this aspect. Further, there is no concept of providing awareness on the usage of healthy semen (especially in Artificial Insemination technique) which results in the adulteration of the animal's breed.¹²⁰

Measures Adopted

A project funded under the Public Sector Development Project (PSDP) programme namely "Special Program for Strengthening SPS Facilities and Quality Inspection Services" has been initiated by the "Integrated National Animal and Plant Health Inspection Services" (NAPHIS) which is placed under the newly formed Ministry of National Food Security after the devolution of powers to the provinces. The main objective of the project is to bring all measures related to animal health and quarantine in compliance with the WTO standards. With an estimated budget of PKR 415 million, it is scheduled to be completed by the end of 2012. The specific objectives include the capacity building of agricultural line departments for international accreditation; ensuring compliance of national/international food safety laws for better trade; developing an integrated SPS management system; and finally being a focal organization for SPS related matters, and establishing NAPHIS as the regulatory authority on SPS measures in Pakistan.¹²¹

NAPHIS is currently coordinating with United Nations Industrial Development Organization (UNIDO) under the EU funded Trade Related Technical Assistance (TRTA II) program to develop a suitable model for integrated food safety and SPS management in Pakistan. It is also operating as a "Think Tank" for technical input on national and international levels for Pakistan.

With the aim of tackling the traceability issues, PDDC has initiated to provide tagging equipment to dairy farmers through its Rural Services Provider Program (RSPP) and Model Farm Program. Traceability initiatives have also been undertaken in the private sector by Belgian Blue Cattle Farms Pakistan (BBCF Pakistan) and Nestlé's Responsible Sourcing Traceability Programme. Besides this initiative, the Punjab Agriculture and Meat Company (PAMCO) have initiated E-Tagging system at approximately 2,500 livestock farms to ensure that the traceability of animals is observed. The project has been initiated with the assistance of a United Kingdom based firm "Cabrob" which is responsible to provide tagging. The programme is run under the title "Save the Calf and Feedlot Fattening Programme". PAMCO is providing free of cost E-Tagging services to these farms. However, the current outreach accounts for 10% of the total target. This requires entry of similar companies and initiatives together with investment for achieving better results.

Impact Assessment

The Punjab Pure Food Rules have been revised under the influence of the project and set out standards for food safety that are within the requirements of the international Codex Alimentarius Commission. This has provided an important stepping stone for the further development of food control system in the province. The federal food safety approach is also being planned to be implemented through the launch of the Federal Food Safety, Animal and Plant Health Authority. The impact of the initiatives has not been realized in the dairy sector as these have not been fully implemented as yet.

As far as initiatives on the issue of traceability, no authentic records were found that could be mention in this study.

Recommendations

- i. *To increase competitiveness and export potential of Pakistan's dairy products in the world market, it is essential that the Federal Food Safety, Animal and Plant Health Authority bill may be converted into legislation at the earliest since the federal food control system will have a*

¹²⁰ Various dairy farmers in Punjab

¹²¹ NAPHIS, Ministry of National Food Security

positive and speedy impact on the revision of foods laws and regulations in the provinces as well.

- ii. *The issue of traceability is central to the provision of safe and hygienic dairy products not only in the international markets but also for the safety of domestic consumers. The Dairy Hubs would provide a convenient opportunity to the government in launching an action plan including; registration of all animals within the defined region, information on feed provision, insemination¹²² and vaccination, and disease occurrence amongst the herd population. The data should be gathered electronically and saved at the remote server in the hub headquarters and should be made accessible via internet for regular updates. Upon receipt of the information, the animals may be tagged accordingly.¹²³*
- iii. *Setting up disease-free zones¹²⁴ within the hubs is a realistic approach by restricting the movement of animals from one hub to another and thereby containing the occurrence of any disease. The principle of regular testing and culling of infected animals must be encouraged amongst farmers in the hubs to safeguard precious livelihoods.*
- iv. *In the short to medium term, awareness amongst domestic consumers regarding traceability of dairy products to strengthen bio-security in the country¹²⁵ should also be addressed through employing media and social opinion leaders primarily. The subsequent demand for safe and traceable dairy and other food products would create an environment of regulation in the country which would put pressure on the local producers to follow the principle of "One Step Forward, One Step Back Linkages". Through this concept, the exact supplier of any contaminated/unsafe dairy products and its subsequent consumer would be easily identified and the risks contained. This can be achieved through compulsion of required documentation of the food chain by domestic dairy processors and also through presentation of such information as and when required.¹²⁶ In the medium to long run, the Ministry of Commerce should lobby the establishment and existence of disease-free zones within the country in the international markets; once the same have been declared through self-assessment by the government in the proposed hubs. Bilateral agreements and concessions should then be effectively negotiated with regions like the EU to allow importation of Pakistani livestock (other than animal casings) and dairy products.¹²⁷*

International Marketing of Dairy Products

Domestic marketing serves as a key element of international marketing. A strong domestic base acts as basis of generating international trading activity. Unfortunately in Pakistan, almost 95% of milk distribution is done through the informal marketing and distribution channels that affect the quality of milk supplied to the consumers. There is no appropriate monitoring and evaluation mechanism which could correct this situation. The same is reflected when it comes to internalization of dairy and dairy products. A weak domestic regulatory regime does in no way facilitate the dairy sector to become internationally compliant due to weak compliant base.

Measures Adopted

As mentioned earlier, the trade policy currently in force does not contain any specific initiatives for the milk and dairy sector from trade perspective. The PDDC and LDDDB are primarily involved in the development programs focusing on the domestic marketing of milk and dairy products rather than on their international

¹²²Exotic viruses can be transmitted through cross-breeding with imported animals (Pakistan Agricultural Research Council, PARC)

¹²³University of Animal and Veterinary Sciences (UVAS)

¹²⁴ Livestock and dairy imports into high-end market like the EU are only allowed through countries declared as disease-free zones. (Punjab Livestock and Dairy Development Board, PLDDDB); Department of Commerce, Industries and Investment, Government of Pakistan

¹²⁵Punjab Livestock and Dairy Development Board (PLDDDB)

¹²⁶Under the EU's General Food Law, 2002, traceability is made compulsory for all food and feed businesses. "It requires that all food and feed operators implement special traceability systems. They must be able to identify where their products have come from and where they are going and to rapidly provide this information to the competent authorities." Documentation requirements include names and addresses of suppliers, and customers in each incidence, nature of the product and the exact date of delivery..

¹²⁷Dairy and livestock producers and processors

marketing. The services of TDAP also remain unutilized for promotion of most of dairy products. The only dairy products exported mainly to Afghanistan (almost 97%) contain pouched processed milk, cream and some other products including powder milk which are exported by a few milk bigger processing companies.

Impact Assessment

Due to lack of concrete policies and compliance to international standards Pakistan is unable to export its milk and dairy products to the international market place. Since exports are mainly to Afghanistan where rules and regulations on quality and standardization are almost absent, the export sector is yet far behind reaching to the level of competence and therefore requires proper policy initiatives. Therefore an objective impact assessment is hard to carry out at this stage.

Recommendations

- a. *Large players in the dairy processing industry and dairy and related products manufactures can be motivated to showcase their exportable products in potential international markets which can be identified by the Commercial Sections of Pakistan in the key potential markets. Appropriate exhibitions can be identified where some selected companies can be sent to display their products. This will greatly help in improving the learning process of the manufacturers as to what types of products are required in the potential markets. Besides, they can learn about branding, packaging and get feedback from potential partners or importers of Pakistani products in the international markets. This will also greatly facilitate motivation in the downstream industry to organize their processing and production methods as per requirements of international buyers.*
- b. *Capacity of the PDDC and LDDDB should be augmented to cater to the international marketing needs of the sector. This is imperative due to the fact that these organizations are very closely associated with the entire system of the industry.*
- c. *To ensure the availability of high quality milk for exports in raw form or value-added products, at first there is an emergent need to implement a consistent and national level "Fresh Milk Quality Policy" in the domestic market. The policy should provide adequate enforcement capacity to the local authorities with the provision of imposition of heavy penalties on producers and marketers that fail to comply with the national milk safety and quality requirements.¹²⁸ Such regulations can prove to be valuable marketing and promotional tools for the government in the international markets.*

Border Measures

The sloppy border measures on the neighbouring borders of Afghanistan and Iran pave way to informal trade of live animals which incur heavy economic losses to Pakistan. Live and productive animals are sent across the border without much problem by the informal traders. This is followed by creating shortage of the livestock that results in artificial escalation of commodity prices in the domestic markets. Resultantly poor breeds remain a constant trouble for the domestic producers. The porous borders of Pakistan result in a loss of valuable breeds and therefore require appropriate strategy to discourage illegal or informal trade of live animals which hurts the interests of ancillary industry like leather and leather products etc. The informal trade and porous border also facilitates the bringing in of unhealthy and unproductive live animals into Pakistan from other sides of the border which poses threat to the domestic species and to the public health.¹²⁹

Measures Adopted

Pakistan Customs is mainly responsible for the checking and quarantine of animals upon entry within the borders of the country. The department is also responsible to prohibit entry of food products containing pork or those that are on the "negative" list.

¹²⁸Milk Processors

¹²⁹Punjab Livestock and Dairy Development Board (PLDDB)

Impact Assessment

Pakistan shares a long mountainous border with Afghanistan. The rough terrain and current law and order situation in the Pakistani neighbouring tribal belts makes it difficult for the border control authorities to protect each and every part of the long border given that the economic and human resources are not enough for this particular purpose. Further to this, corrupt practices in the border and customs personnel make government's efforts to fail. Therefore this situation has resulted into rise in the informal trade of livestock worth millions of dollars from Pakistan thus giving a shock to the national economy.¹³⁰

Recommendation

Informal trade of livestock is not only the single issue of Pakistan as far as border issues are concerned. There are other products that are traded between Pakistan and its neighbouring countries informally. Therefore both domestic as well as international border measures are required to be taken to stop informal trade of precious products from Pakistan.

- a. *The Government of Pakistan and its neighbouring countries should enter into bilateral arrangements where they should adopt measures to restrict the smuggling of live animals across international borders.*
- b. *Appropriate legal reforms resulting in prohibitive penalties should be enforced where the illegal trade of live animals should be restricted and punitive measures should be defined for those involved in such illegal trade. This will greatly reduce the informal trade since the local police will also be involved and authorized to curb smuggling by providing a third tier of check on the informal trade.*

Policy and Regulatory Framework for Dairy Development

Taxes and Tariff Regime

During the primary research where stakeholders were contacted so as to seek their opinion on various regulatory and policy related matters, a number of them mentioned that the government has not established a separate tax and tariff mechanism for the livestock sector. The government usually applies the same duty and tax regime for poultry and livestock sector without considering the fact that both sectors have different parameters and varying levels of advancement. The livestock and dairy sectors require additional incentives as it is far behind the poultry sector which is much better organized and systematized due to specialization and investment by the stakeholders. Therefore a different tax and tariff regime is required to make dairy sector progressing and productive.

Measures Adopted

Recent measures include sales tax exemptions on processed milk, yogurt, cheese, flavoured milk, butter and cream. These measures are aimed at encouraging value addition in the dairy sector. Other measures include duty free import of live animals (bovine), veterinary equipment and vaccines, and dairy and livestock machinery and equipment. Very recently, certain other products such as feed ingredients and inputs used for feed preparation, growth promoters and vitamin pre-mixes were also allowed at zero rated duty.

Impact Assessment

The most immediate impact of the liberal import regime with zero tariffs has resulted in the import of 9,500 exotic animals, 318,768 semen doses and 4,300 embryos of high yielding animals since 2010. This has had a direct and indirect effect on an increase in the establishment of milk processing units in the country.

¹³⁰ Smuggling makes animals dearer, Tahir Ali Khan, Dawn Newspaper,

Recommendation

- (iii) *Keeping in mind that loose milk in the informal sector is not regulated at all; the formal industry ends up facing the brunt of government taxes. A balanced approach to provide a level playing field should be adopted to nurture appropriate competition between the two sectors. An increase in the cost of production by the formal industry may lead to reliance on imported packaged products in view of future demand.*¹³¹

Reforms in Milk Pricing Mechanism

The domestic dairy market is currently facing a dichotomy in which the price of loose milk is being regulated by local authorities in the urban markets while no such regulations are applied to prices of packaged milk in the formal sector. In case of loose milk, the designated officials of the local authorities carry out a market survey and then in consultation with the relevant stakeholders fix a selling price of loose milk in the domestic market.

Measures Adopted

The “Price Control Committees” formed under the provincial/ district governments carry out consultations with the dairy associations to fix the retail price of milk in the local markets.¹³² The price to be negotiated with these committees by the associations is initially agreed mutually by their members.¹³³

Impact Assessment

The practice of price control is highly flawed as in the first instance the members of the relevant association(s) come together and agree upon a mutual price and secondly; the forum of the association(s) is then used for fixation of price in coordination with the local authorities. This method gives rise to collusive practices and deteriorates the domestic competition environment. The associations also generally have low negotiation powers to advocate the selling price on behalf of their members with the local authorities.

Another aspect is the potential inability of local producers to sell milk at the fixed price in view of their cost of production. These enhance constraints in ensuring consistency in milk supplies to the domestic consumers and also result into rise in the incidents of sale of adulterated/ low quality milk. Even when the price is fixed, either due to limited capacity or lack of proper enforcement mechanism, the local authorities have limited authority to resort to punitive measures for those milkmen and retail shopkeepers who increase the prices illegally.

Recommendations

- i. *It is proposed that the relevant government authorities should immediately withdraw their support from fixing and controlling the selling price of loose milk. The practice of using private associations as forums to negotiate prices and the consequent ‘collusion’ created by the government is against the spirit of competition and that all such agreements are prohibited under Section 4 of the Competition Act, 2010.*¹³⁴
- ii. *The intention behind price fixation is to keep milk and dairy products affordable for the local consumers. The same can be achieved in a more effective and sustainable manner through introduction of open competition in both formal and informal sectors. The price of milk will reach equilibrium once the demand for quality milk is driven by consumers and this would also*

¹³¹ Pakistan Dairy Association (PDA)

¹³² Arid Agriculture University, Rawalpindi

¹³³ According to the latest price control list issued by the City District Government Lahore (CDGL), the selling price of buffalo milk is fixed at PKR 50/ litre (USD 0.5), cow milk at PKR 45/ litre (USD 0.47) and yogurt at PKR 50/ kg (USD 0.5) within the urban area.

¹³⁴ Section 4(1) prohibits and renders void “all agreements between undertakings, decisions by associations of undertakings and concerted practices which have as their object or effect the prevention, restriction or distortion of competition in trade in any goods or services in the State or in any part of the State”. The Act lists some specific types of behaviour which are expressly prohibited. These include “Fixing the purchase or selling price or imposing any other restrictive trading conditions with regard to the sale or distribution of any goods or the provision of any services.”

have a subsequent impact on improving production efficiencies of the dairy farmers and producers to effectively compete in the domestic market.

Revisiting the 18th Constitutional Amendment

The main focus of the 18th constitutional amendment was to provide greater autonomy to the provinces in order to ensure better service delivery to the public. It is considered as a landmark achievement of the current government. Through this amendment, the subject of agriculture previously maintained by the federal government has been devolved to the provinces with an overall objective to give them more autonomy in policies and actions. The federal government is now responsible for making national policy on livestock and dairy.

Impact Assessment

Since the newly formed federal Ministry for Food Security and Research is still in its infancy post the recent constitutional amendment, it is quite early to assess its impact. The LDDB) and PDDC are trying to find sound footing in coordination with the relevant provincial departments for future development of the dairy sector.

Recommendations

- (i) *It is important that the skills of the personnel employed in all relevant provincial departments should further be developed to formulate and execute policies in agriculture and livestock. The Ministry of Food Security and Research needs to take a central role in training these personnel for the development of policies and their implementation in coordination with international training organizations.*
- (ii) *In the dairy sector, farmers being the producers are to be considered as major stakeholders by the provinces. Therefore, it is imperative to institutionalize their participation in developing policy instruments for the industry. The same can be ensured through implementation of the dairy hubs which would particularly increase representation of the small holders and also create a mechanism for obtaining instant feedback on the developmental initiatives.¹³⁵*
- (iii) *A key element that was central to providing autonomy in the agriculture sector was implementation of a structure by the provinces for collection of agricultural income tax from the producers. It is about time that this initiative may be implemented as the contribution of the sector to the GDP stands at about 25% while its share in the tax collection is less than 1%. The provincial legislators must consider this fact and initiate an effective dialogue with the relevant stakeholders. This would help in increasing the tax to GDP ratio and also ensure increase in provincial revenues which can be utilized for funding of development initiatives for the agriculture sector.¹³⁶*

Revamping Food Safety Regime

Currently Pakistan does not have a cohesive and clear set of regulations for either imported or domestic food products at the federal level. Within the present structure, the federal government is solely responsible for regulating the food imports including dairy products while the provincial governments are mandated to enforce standards in the domestic market through relevant health and safety departments.

The import regulations excessively rely on the premise that if the product is sold in the country of origin and meets the domestic safety requirements, then it meets Pakistan's requirements as well; therefore establishing a reactive rather than a proactive approach in regulating food imports. Other than the above, the focus is on ensuring adequate shelf life.¹³⁷

¹³⁵Livestock Farmers and Breeders Association

¹³⁶Varying estimates place the revenue potential from taxing the agricultural income from PKR 40-60 billion to as high as PKR 250-300 billion. Nevertheless, the potential influx of public funds is significant in view of current economic conditions of the country (Source: Pakistan Institute of Legislative Development and Transparency (PILDAT), Briefing Paper: Taxing the Agricultural Income in Pakistan, November 2011)

¹³⁷At least 50% original shelf life at the time of importation of the food product into Pakistani territory

Between the two over-riding laws for food safety, there is an overlapping in food standards between the Pakistan Pure Food Ordinance 1960 (PFO) and the Pakistan Standards and Quality Control Authority Act (PSQCA), 1996. The PFO does not cover contamination of food by pesticides, mycotoxins, specific microorganisms and, heavy metals while the PSQCA Act has a more domestic outlook and ignores quality testing, inspection and regulation of the imported food stuffs.

In relations to the Codex Standards, the PFO lacks in covering import/export inspection and certification, exchange of information with export markets in rejection of food items in emergency situations, accreditation of imports/exports, and development of equivalence agreements and inspection in relation to SPS measures with the trading partners, and production and issuance of electronic certificates as per Codex guidelines. In comparison to this, the PSQCA Act is more comprehensive in covering a larger portion of the above standards but is weaker in terms of coordination with trading countries and import certification.

Impact Assessment

The rising levels of Pakistan's exports in recent years and the restrictions faced by food producers and processors in high-end markets such as the EU have provided an impetus for drafting of various new food safety laws and amendments of previous ones at the federal and provincial levels. A draft bill has been proposed to the parliament for establishment of the Federal Food Safety, Animal and Plant Health Authority to overlook the SPS and TBT measures in compliance with the international regulations. The provinces have initiated amendments in the existing food laws to be implemented in their designated territories. The draft laws regarding milk safety and animal breeding have been submitted to the provincial cabinet of Punjab while Sindh and KPK are following course in drafting such laws. During the current year, Punjab Food Authority has been established and given regulatory powers to ensure food safety standards in the province.

Pakistan still needs to cover immense ground on major issues, other than food safety, such as SPS measures, traceability, residual control and testing in food and feed, implementation of Good Agricultural Practices (GAP), quarantine treatment and safety of food packaging materials.

Recommendations

- (i) *It is proposed that international accreditation of food testing laboratories should be undertaken at the federal level and capacity building and enhancement of the food inspection services be carried out under NAPHIS.*
- (ii) *The Pure Food Ordinance (PFO) should be amended in view of the Codex standards to include 400 new food items including dairy products in addition to the existing 105 items currently being covered by the legislation.*
- (iii) *The food testing laboratories working under the PSQCA and provincial governments should be upgraded to enhance their capacity for microbiological analysis.*
- (iv) *Currently there are no laws governing and regulating sale of the unprocessed milk produced in unorganized sector in the domestic market. The producers need to be incentivized through the dairy hubs to produce better quality milk. The regulations should include a mechanism to ensure enforcement of quality standards with the provision of applying prohibitive penalties (civil and criminal) by the local authorities.¹³⁸*
- (v) *The quality of packaged milk produced in the formal dairy industry should be regulated through a mandatory requirement of "Ingredient Labelling" which would show the actual ingredients being used in the UHT/ pasteurized milk and other dairy products and would be open to testing.¹³⁹*

Improving Outreach of Financial Support

The dairy as well as livestock farmers are generally unaware of the credit schemes offered to them by the government through various government run as well as privately owned financial institutions.

¹³⁸ Khyber Pakhtunkhwa Chamber of Commerce and Industry (KPKCCI)

¹³⁹ Currently none of the dairy processors include a mention of the ingredients used on the label of their packaged milk and dairy products. (Source: Punjab Livestock and Dairy Development Department)

Even if the farmers and other stakeholders working in the dairy sector know about the credit schemes, they avoid availing them due to lengthy and cumbersome loaning procedures including processing time as well as documentary requirements. High mark up on the credit facilities is yet another impediment in provision of financial facility to the farmers.

It has also been reported that the outreach of the Micro Finance Banks (MFBs) and Micro Financial Institutions (MFIs) is either inefficient or the supply of credit is inadequate to meet the original financial requirements of the farmers' community. The operating costs of farmers get to as higher as 22% per annum in the dairy sector. This generally makes micro finance a little attractive and less viable option and therefore a large number of farmers cannot avail the facility.

Measures Adopted

Currently 26 commercial and microfinance banks are operating in Pakistan through their branch network base of more than 3,900 designated branches for agricultural credit purpose. These financial institutions prominently include Allied Bank Limited (ABL), Habib Bank Limited (HBL), Muslim Commercial Bank (MCB), United Bank Limited (UBL), two specialized banks i.e. Zarai Taraqiati Bank Limited (ZTBL), Punjab Provincial Corporative Bank Limited (PCBL) and 14 private domestic banks. Furthermore, five microfinance banks (MFBs) are also providing financing to the farmers. Amongst other agricultural activities, livestock farming is also covered under certain financing schemes.

Impact Assessment

The total amount of funds for the agriculture credit disbursement increased to PKR 285 billion in 2011-12, as compared to PKR 263 billion in the preceding year. More than 65% of the total credit disbursement was made to the farm sector, including livestock and dairy, which was higher than the previous year. However, small farmers face difficulty in receiving credit from the mainstream financial institutions due to the inability of securing them through "collateral", an explicit guarantee that is required by the banks to off-set the risk associated with lending. Since small farmers do not usually own any such guarantee or security, they remain outside the net of potential borrowers.

Recommendations

- a. *The State Bank of Pakistan should instruct the banking sector to launch facilitation desks at all the branches offering credit schemes for the dairy and livestock sector (mainly covered under agricultural credit). Besides, other branches and banks not offering agricultural credit facilities should also be equipped with proper information so that a maximum number of people are approached and provided information on the agricultural credit schemes offered by certain financial institutions in the public as well as the private sector. Media campaign (electronic and newspapers) can also help in spreading information in the farmers' community. People should be able to know the cost and benefits of availing a financial facility so that no deceptive marketing should be able to deceive them.*
- b. *Easy and timely access to loans needs to be ensured to small farmers who are mostly illiterate and do not own any guarantees that can be used as collateral. The credit schemes for these farmers should be on the same footing as these are for the medium and large-scale farmers.*

Investment Regulations

As per government and industry sources, the dairy sector in Pakistan is likely to witness major investments in the near future, especially in the areas of corporate farming by large businessmen who are looking to diversify their existing enterprises. Emerging corporate farms are large in size, comprising of 1,000 to 2,500 *milch* animals in their herds. These animals have been imported mainly from Australia, Denmark and Sweden due to the reason that these carry 4-5 times more productivity as compared to the local breeds. Thus the much higher rates of return offered by the dairy sector has served as a major attraction for the local investors to adopt dairy farming business.

Recommendations

- (i) *As the dairy sector formalizes over a period of time and investors realize the returns on their investments, the government would need to apply some control measures to regulate the number and size of farms. This is especially required while keeping the environmental impacts of dairying in mind.*

- (ii) *A quota system based upon the number and size of the farms (at least 50-100 in number) may be adopted, driven through licensing by the district and local governments in the region. It is recommended that at least a 3 km aerial distance may be enforced in the establishment of adjacent farms to avoid over-crowding of the units in a particular area. This is important to avoid congestion of dairy farms in the urban areas and reduce pressure on land and soil as well as avoid mismanagement of the bio waste.¹⁴⁰*

¹⁴⁰ SMEDA

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ANNEXURE: IMPORT REGULATIONS OF POTENTIAL DAIRY EXPORT MARKETS

On the basis of market analysis provided in the Section III above, a brief overview of the SPS and technical regulations and standards of these potential markets is described below:

Singapore

The dairy imports into Singapore are governed by the Sale of Food Act (SFA) 2002 and the Food Regulations 2002 administered by the national food safety body called the Agri-Food and Veterinary Authority of Singapore (AVA). The SFA defines the food products, prohibits selling of contaminated foods unfit or unsafe for human consumption or those which are not properly labeled or packaged and may mislead consumers. The Food Regulations (2002) on the other hand specify standards for food safety including permitted additives and their maximum limits, tolerable limits for chemical residues, and standards for labeling and advertising.

Import Regulations

Dairy Products from Foot-and-Mouth Disease (FMD) affected Countries. The following are import requirements for dairy products (liquid milk, cheese, butter, ice-cream, yoghurt, milk powder) from FMD affected countries:

1. Submission of a documentary proof (one time submission) that dairy products are manufactured in premises regulated by a competent authority (for e.g. a certified true copy of the manufacturer's licence)
2. Submission of a health certificate (for every consignment) stating that the dairy raw ingredient has been subjected to one of the following procedures:
 - a. *a sterilization process applying a minimum temperature of 132o C for at least one second (ultra-high temperature, UHT), or*
 - b. *if the milk has a pH less than 7.0, a sterilization process applying a minimum temperature of 72 oC for at least 15 seconds (high temperature – short time pasteurization [HTST]), or*
 - c. *if the milk has a pH of 7.0 or over, the HTST process applied twice.*
- The Health Certificate should include the following information¹⁴¹:
 - a. *Description of the products including brand name and nature of product;*
 - b. *Quantity in the appropriate units;*
 - c. *Lot identifier and date of production;*
 - d. *Name and address of the manufacturer or the processing establishment*
 - e. *Name and address of the importer or consignee;*
 - f. *Name and address of the exporter of consignor;*

¹⁴¹http://www.oie.int/eng/Status/FMD/en_fmd_free.htm for a list of FMD free countries

g. Country of dispatch;

h. Country of destination

Pasteurized Liquid Milk from FMD-Free Countries. The following are import requirements for pasteurized liquid milk from FMD-free countries:

- Submission of a documentary proof (one time submission) that products are manufactured in premises regulated by a competent authority (e.g. a certified true copy of the manufacturer's license)
- Submission of health certificate (for every consignment) that pasteurized liquid milk are:
 - a. produced using milk ingredients originating from FMD free countries;*
 - b. has been pasteurized by heating at a minimum temperature of 72oC for a minimum of 15 seconds or an equivalent process.*

(ii) The Health Certificate should include the following information:

- a. Description of the products including brand name and nature of product;*
- b. Quantity in the appropriate units;*
- c. Lot identifier and date of production;*
- d. Name and address of the manufacturer or the processing establishment*
- e. Name and address of the importer or consignee;*
- f. Name and address of the exporter of consignor;*
- g. Country of dispatch;*
- h. Country of destination¹⁴²*

Infant Formula for Age 0 – 12 Months. The following are import requirements for infant formula, and follow-on formula (age 0-12 months):

- i. Submission of documentary proof (one time submission) that the imported infant formulas are manufactured in a premise regulated by the competent authority (e.g. certified true copy of the manufacturer's license),
- ii. FMD-free Countries. Submission of the health certificate that must contain the following attestation by the relevant competent authority of the exporting country:
 - a. products are produced using milk ingredients originating from FMD free countries and*
 - b. liquid milk used is pasteurized by heating at a min 72oC for a minimum 15 seconds or an equivalent process.*
- iii. FMD-affected Countries. Submission of the health certificate that must contain the following attestation by the relevant competent authority of the exporting country:

¹⁴²http://www.oie.int/eng/Status/FMD/en_fmd_free.htm

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- a. *a sterilization process applying a minimum temperature of 132o C for at least one second (ultra-high temperature [UHT]), OR*
 - b. *if the milk has a pH less than 7.0, a sterilization process applying a minimum temperature of 72oC for at least 15 seconds (high temperature – short time pasteurization [HTST]), OR*
 - c. *if the milk has a pH of 7.0 or over, the HTST process applied twice.*
- iv. The health certificate should include the following information:
- a. *Description of the products including brand name and nature of product;*
 - b. *Quantity in the appropriate units;*
 - c. *Lot identifier and date of production;*
 - d. *Name and address of the manufacturer or the processing establishment;*
 - e. *Name and address of the importer or consignee;*
 - f. *Name and address of the exporter of consignor;*
 - g. *Country of dispatch;*
 - h. *Country of destination.*
- v. Submission of health certificate or manufacturer quality control (QC) reports on chemical and microbiological test (every consignment)

Import Requirements for Processed Foods:

Processed Foods: Processed food may be imported from any country. Importers should ensure that the processed food products are produced in an establishment under proper supervision of the competent food authority of the exporting country or which has a quality assurance program acceptable to AVA. Documentary proof that the products imported are produced in a regulated establishment is required for products imported. Further information on obtaining of food from regulated sources can be found at AVA's website: www.ava.gov.sg

Importers are advised to initiate some quality control checks on the products by sending the products to accredited laboratories for analysis. A list of accredited laboratories can be found at the Singapore Accreditation Council-Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) website.

General requirements for labelling: The law requires that the following basic information be declared and be provided in English:

- i. Name or description of the product.
- ii. The common name of the food or drink or a description which is sufficient to indicate the true nature of the product.

A complete list of ingredients and additives should be declared in descending order of the proportions by weight in which they are present on each product label, i.e. the ingredient that weighed the most should be listed at the top. The exact identity or the permitted generic terms of the ingredients and additives should be declared. International Numbering System (INS) number or E number can be used for declaration of food additives. Imported food, the label should indicate the name and address of the local importer,

distributor or agent. Telegraphic, facsimile and post office addresses alone are not acceptable. Milk regulation are stipulated in Milk Regulation 109 (source: AVA website).

Expiry date marking: Expiry date information is required to be permanently marked or embossed on the package, and printed in letters not less than 3 mm in height, along with the general labeling requirements.

Country of Origin of the product: The labels of imported foods must contain the name of the country of origin. The name of a city, town or province alone is not acceptable as an indication of country of origin.¹⁴³

Hong Kong

The basic food law in Hong Kong is laid down in Part V of the Public Health and Municipal Services Ordinance (Chapter 132). The main provisions cover general protection for food purchasers, offences in connection with sale of unfit and adulterated food, composition and labeling of food, food hygiene, seizure and destruction of unfit food, and the Authority's power to make an order to prohibit import/ supply and to order a recall of the food under certain conditions.

Import Regulations

- i. Hong Kong's milk regulation allows two types of milk registration: pasteurized and sterilized milk.
- ii. Any imported fluid milk or milk beverage to be imported has to be sourced from a manufacturer that has been approved by the Director of Food and Environmental Hygiene.
- iii. Application's approval requirements: Full name and address of the milk or milk beverage processing plant; the law of the country of origin governing the production of milk or milk beverages empty containers of the milk or milk beverage with labels; information on the heat treatment method of the milk or milk beverage and facilities including production equipment and water supply, in the processing plant; a certificate from an appropriate authority in the country of origin.
- iv. The Centre for Food Safety of Food and Environmental Hygiene Department (FEHD) requires importers to provide an official health certificate for the importation of meat products, frozen confection, and dairy products. When a consignment arrives and before its release, the products will be inspected and if necessary sampled. Upon the satisfaction of the Department, a "release" letter will be issued to the importer.
- v. Labelling requirements (information regarding ingredients with weights, nutritional information, best-before/ used by date, storage information, manufacturer and distributor information, country of origin, etc.)¹⁴⁴

Philippines

The regulation on food in the Republic of the Philippines is enshrined in the 1987 Philippine Constitution. Statutory laws are also in place providing legal basis for the creation of a regulatory agency. The Bureau of Food and Drugs (BFAD) is mandated to ensure the safety, efficacy and good quality of all food products being made available to the general public.

International standards and guidelines including those recommended by the World Health Organization (WHO), United States Pharmacopeial Convention (USP), Food and Agriculture Organization (FAO) and Codex Alimentarius are used as a basis for formulation and implementation of rules and regulations governing the manufacture, importation, exportation, distribution or sale of food. Republic Act No. 9711, also known as the Food and Drug Administration Act of 2009, also renamed the BFAD as the Food and

¹⁴³www.ava.gov.sg

¹⁴⁴www.cfs.gov.hk/english/food_leg/food_leg_nl_guidance.html

Drug Administration (FDA) with improved administrative and technical capacity in the regulation of food, drugs, cosmetics and device establishments and products.

Import Regulations

- i. Import licenses/permits are to be acquired and a Certificate of Product Registration (CPR), renewable annually, must be secured from BFAD prior to initial importation.
- ii. All agricultural and food products entering the Philippines must be accompanied by a phyto-sanitary or health certificate issued by the regulatory body in the exporting country. This is required to be submitted for inspection along with the import permit to facilitate physical inspection of the goods and customs clearance at the port of entry.
- iii. All imported food and agricultural products are required to comply with the Philippines' food health and phyto-sanitary laws. In general, none of these products is allowed to enter the Philippines if it is deemed to pose a danger to human life or well-being, either directly or indirectly.
- iv. All food and agricultural products, including plant products that enter the Philippines, are required to pass through procedures designed to check that they are not contaminated with any pest and that they are fit for their intended use.
- v. Under Philippine import laws, it is the responsibility of the importer to ensure that any product entering the country's customs territory is in full compliance with Philippine health and phyto-sanitary regulations. The enforcing authorities will check for compliance by inspecting the goods and relevant import/export documentation and decide on whether the goods may enter the Philippines.
- vi. Labeling requirements: Name of the food, List of ingredients used in the product (in decreasing order of proportion), including additives, flavorings and preservatives used; Net contents and drained weight; Name and address of manufacturer/packer or distributor, including country of origin for imported products and name and the address of Philippine importer/distributor; Lot identification.
- vii. BFAD requires that importers provide advance copies of the labels of the products they intend to import.
- viii. All processed food products offered for retail sale in the Philippines must be registered with BFAD. Registration of imported products may only be undertaken by a Philippine entity, although some documentation and, for certain types of products, samples need to be provided by the exporter.
- ix. Exporters should also note that a Philippine importer needs to secure a License to Operate (LTO) from BFAD, which is actually a prerequisite for the registration of any food product.¹⁴⁵

Thailand

The Thai FDA is the principal department of the Ministry of Public Health (MOPH) and in-charge of consumer safety in the consumption of food. They have six basic responsibilities: (i) to legislate notifications of the Ministry of Public Health, (ii) pre-marketing controls, (iii) post-marketing controls, (iv) surveillance, (v) support and cooperate with the technical side of the food industry, and (vi) disseminate knowledge and develop public awareness for health food choices.

The food regulatory system works in a vertical system. This means regulations, quality standards and some safety standards (such as micro-organisms and some food additives) are created specifically for products such as milk, vinegars, sauces, candies, jams, mineral water, dietary supplements and supplementary food for infants and young children.

¹⁴⁵www.bfad.gov.ph, www.da.gov.ph

Import Regulations

- i. A limited amount of processed or packaged food samples for product registration and consideration for purchase can be brought in without an import license from the Food and Drug Administration (FDA). However, samples of raw, fresh or frozen foodstuffs e.g. meat, vegetables and fruits may be subject to other regulations established by the concerned authorities.
- ii. For imported foods, a Thai label must be applied where needed prior to entry and be affixed to every single item of food prior to marketing. Failure to apply the label before entry will lead to product seizure by the FDA. Note that the Thai FDA requires pre-approving of a label only for specifically-controlled foods. For other foods, the food manufacturers or food importers are responsible to prepare a product label complying with the Ministerial Notification No. 194 B.E. 2543 Re: Labeling.
- iii. Labels for food products sold directly to consumers shall be in Thai language with and shall have the following details, except for those exempted by the FDA:
 - a. Name of food.
 - b. Food serial number.
 - c. Name and address of manufacturer or repacker, as the case may be, together with the country where the product is manufactured.
 - d. Net content of food in metric system.
- iv. Powdered, dry or solid food products shall display net weight.
- v. Liquid food products shall display net volume.
- vi. Semi-solid or semi-liquid food products can display either net weight or net volume.
- vii. Other food products shall display net weight. Food products in sealed containers shall display net content as well as drained weight except food ingredients cannot be separated from the liquid part.
 - a. Essential ingredients listed as percentage of the total, starting with the major ingredient. For concentrated products or those needing to be diluted or dissolved before consumption, the proportion of the products when diluted or dissolved must be displayed.

Indonesia

The Food Act (1996) comprehensively covers legislative regulations relating to food besides reviewing those already in place and creating new ones. It controls the domestic production, imports, processing and distribution of food.

Many of Indonesia's regulations related to marketing of food are unclear and confusing and therefore either these are not enforced at all or are only enforced inconsistently. The most difficult problem for exporters shipping high valued products may be the requirement that all imported products be registered with the National Agency for Drug and Food Control (BPOM) to obtain food registration (ML) number. In addition, some products require additional approval from BPOM and animal-based food requires an import permit from the Director General of Livestock in the Ministry of Agriculture.

Import Regulations

- i. Importer must obtain an import permit (SPP) or import recommendation before product is shipped.

- ii. An import approval recommendation from the Ministry of Agriculture is required in addition to an import permit (SPP) from the Ministry of Trade and from BPOM for food products containing animal-based ingredients
- iii. Food labels in the form of supplementary label are to be in the Indonesian language and must be easily understood by consumers.
- iv. Labelling requirements: Product name, weight or volume in metric units, composition or a list of ingredients, use by date, production code, BPOM registration number, and the name and address of the manufacturer or importer. Any person producing or importing food which is packed for sale (*not institutional packed for the food service sector*) into the territory of Indonesia is obligated to place a label on, within and or at the packing of the food.
- v. An Import Permit (SPP), issued by the Ministry of Trade, must accompany every import of poultry, meat, and other animal based food. The SPP will be issued after getting the Import Recommendation Approval (RPP) from the Ministry of Agriculture (Directorate General for Livestock Animal Health Service (DGLAHS) for live animal and animal products) or from National Agency for Food and Drug Control (BPOM) for processed animal products.
- vi. Any entry of animals, materials of animal origin, or products made of materials of animal origin are subject to the following conditions:
 - a. *Importers must obtain an import permit from the Ministry of Trade.*
 - b. *The permit for import of live animal, animal products, and processed animal products that possess risk of zoonosis spread will be released after obtaining Import Approval Recommendation (RPP) from the Ministry of Agriculture. The Minister of Agriculture delegates authority on the issuance of RPP to the Directorate General of Livestock and Animal Health Services.*
 - c. *Importation must be made through designated points of entry.*
- vii. Certificate of Origin Country can be issued by Chambers of Commerce or notary public.
- viii. Materials of animal origin or products made of materials of animal origin, which include dairy products, intended for human consumption must also be accompanied by a *Halal* certificate from an accredited Islamic Council (except pork).
- ix. Other certificates needed for certain processed food products are as follows:
 - a. *Composition analysis certificate from producers (must be original, valid for 6 months).*
 - b. *Genetically Modified Organism (GMO) content certificate.*

Sri Lanka

In Sri Lanka Food Control System is working under the Ministry of Healthcare, Nutrition and Uva Wellassa Development. Over the last few years Sri Lanka has initiated action to revise / review the existing Food Regulations. This is done in keeping with the guidelines of the Codex Alimentarius Commission and other texts to ensure that a set of science-based and risk-based regulations is in place to strengthen country's regulatory system with the assistance of a national consultant where a complete set of draft regulations have been prepared.

Import Regulation

- i. The government of Sri Lanka has adopted the open market policy on the trading of dairy products. As such all dairy products are under open general license system and the only requirement the

importers of dairy products have to comply with are the standards set by the Sri Lanka Standards Institution.

- ii. Milk powder has a 10% duty rate, and a 4.5% national security levy.
- iii. In addition the importers also incur a cost when opening letters of credit for such imports. This is the stamp duty on the letters of credit, and at present it is equivalent to 2.5% of the CIF value of the consignment for import.
- iv. Food importers must ensure that imports reach Sri Lanka prior to the expiration of a minimum of 60% of time before the expiry date.
- v. The Sri Lanka government is planning to make it compulsory for the sellers of milk powders to print on the packaging of such products the date of manufacture of the powder, so that the import of very old stocks of milk powder at give- away prices from international markets are discouraged from entering the domestic market and influencing the domestic milk prices.

Nigeria

The Nigerian Agency for Food and Drug Administration (NAFDAC) is the primary agency for monitoring food and drug standards in the country. The organization draws its powers from the Food and Drugs Act, 1990, which established the agency through the amended Decree 21 of 1999. It is responsible for food safety through control and regulation of product manufacturing, exportation and importation, sale, distribution and advertisement in the country. NAFDAC's scope is "to regulate, protect and promote public health by ensuring the wholesomeness, quality, safety and efficacy (as applicable) of food, packaged water, drugs, cosmetics, medical devices, chemicals and detergents (referred to as regulated products) consumed in Nigeria."

Import Regulations

- i. The manufacturer shall make an application for the registration of processed food.
- ii. Importers of food products must first submit an application on a prescribed form to the Directorate of Registration and Regulatory Affairs, National Agency for Food and Drug Administration and Control (NAFDAC), stating the name of the manufacturer, name (brand name where applicable) of the product. This form, labeled "FORM D-REG/001" is available online at NAFDAC's website for download.
- iii. The Nigerian importer/distributor must file evidence of a Power of Attorney from the manufacturer, which authorizes him to be the representative in Nigeria.
- iv. A certificate of manufacture and free sale issued by a competent health authority, authenticated by the Nigerian Embassy in the country of origin. Product license or evidence of product registration in the country of origin is an added advantage.
- v. All importers must submit the certificate of registration of brand name/ trademark with the trademark Registry in the Ministry of Commerce in Nigeria. This is done in the name of the owner of the trademark to protect the owner.
- vi. NAFDAC regulations require food labeling minimum labeling requirements: A product's brand name or common name must appear in bold letters. Name and full "location" address of the manufacturer showing country of origin must be provided on the product label.
- vii. The production "batch" or "lot" number, date of manufacture and best before/expiry date. Net content, specifying essential ingredients in metric weight for solids and metric volume for liquids. Ingredients must be listed by their common names in order of their prominence by weight. Food additives and colors must be declared on the label. NAFDAC registration number must be included

on the product label. Labeling should be in English. If it is in another language, an English translation must be shown on the label or package insert (where applicable).

- viii. For production and expiry dates, Nigerians write the date before the month. Exporters are advised to specify the month in words (July 1, 2005 or indicate mm/dd/yr) to avoid conflicts that may arise in mistaking the day for the month.
- ix. NAFDAC regulation stipulates that all food products should carry best-before dates and/or shelf life on their packaging. The regulation states that the expiry date should be "at least half the shelf life as at time of inspection." The last sentence is interpreted to mean that at the time of inspection (by NAFDAC after clearing Customs), that the period from the inspection date until the expiration date should be equal to or greater than half of the total shelf life of the product¹⁴⁶.

Bahrain

The Kingdom of Bahrain is member of the Gulf Cooperation Council (GCC)¹⁴⁷. The office of Agricultural Affairs (OAA) covers all GCC countries except Saudi Arabia. The standards for all food and non-food products are being developed and implemented through the Gulf Standards Organization (GSO). The GSO makes regulations in the areas of food products' labeling requirements, packaging and container requirements, permitted and non-permitted food additives, pesticides and other containments. It also specifies food import procedures into the GCC and the applicability of trademarks laws in food products.

Import Regulations

- i. Under the Unified Customs Law (UCL), some food products including live animals, fresh fruits and vegetables, some seafood, grains, flour, tea, sugar, spices and seeds for planting are exempt from tariffs. It also established a single entry point policy. In other words, a product entering any GCC member market would pay the appropriate duty only at the point of entry and would then be permitted duty free transit among GCC member countries.
- ii. "Sample" consignments face no special requirements. Samples destined for food shows or other types of promotional events are exempt from local label requirements. However, health certificates and invoices noting that the products are not for sale and are of no commercial value are required.
- iii. The food label must include on the original label or primary packaging the following information:
 - a. *Product and brand name*
 - b. *Ingredients and additives, in descending order of proportion*
 - c. *Net content in metric units (volume in case of liquids)*
 - d. *The name and address of the manufacturer, producer, distributor, importer, exporter or vendor shall be declared on the label*
 - e. *Country of Origin*
 - f. *Origin of animal fat (e.g. beef fat)*
 - g. *Production and Expiry dates, (best or sell by dates are also acceptable as expiry dates)*
 - h. *Instructions for use (if any)*
 - i. *Special storage, transportation and handling instructions*

¹⁴⁶ www.nafdac.gov.ng

- j. *Lot identification*
- k. *Nutritional labelling is voluntary, until now. However, a binding standard has been prepared by the GSO and notified by some GCC countries.*
- iv. Original labels should be printed in Arabic, but exceptions do exist for small lots and ethnic foods. Bilingual labels are permitted, provided one of the languages is Arabic (e.g. Arabic/English). In addition, Arabic language stickers are permitted in lieu of Arabic or bilingual labels provided the sticker:
 - 1) *is extremely difficult to remove.*
 - 2) *includes the following essential information:*
 - a. Product name
 - b. Ingredients
 - c. Net weight
 - d. Country of origin
 - e. Dates of production and expiry, if they are part of the original sticker and are not being stamped over- Does not cover the original label.
- v. Bahrain will pre-approve food labels prior to import.

The International Trade Centre implemented the Trade Policy Capacity Building Component of the European Union funded TRTA II programme. It is aimed at the Ministry of Commerce and Government of Pakistan in developing a coherent trade policy and attendant regulations for export competitiveness. Specifically, it will aim to reinforce the skills of government officers working in trade related ministries and implementing agencies on issues related to trade policy, commercial diplomacy and regulatory reform. The main way in which to achieve this through the institutional capacity building of key local training institutes, which is intended to have an immediate effect on the capacity of government officers working on trade policy issues.

In addition, Component 1 promotes comprehensive, regular and well informed public-private dialogue among the government, private sector and civil society for trade policy development, monitoring and evaluation. To promote local ownership and legitimacy of the dialogue, a steering committee comprising equal representation of the public and private sectors has been established with the formal approval of the Ministry of Commerce of Pakistan. Its mandate is to oversee the planning, implementation and monitoring of public-private dialogue on key issues. To better inform the public-private dialogue process, research studies are commissioned and internationally peer reviewed before dissemination to stakeholders.

The targeted interventions of Component 1 to achieve these goals constitute the following:

Result for Component 1: Coherent trade policy and regulatory reform for export competitiveness

1. The Pakistan Institute for Trade and Development (PITAD) institutional capacity is strengthened.
2. PITAD's and other research institutes' expertise on trade policy strengthened.
3. Government officers' capacity on specific trade policy and international trade negotiations strengthened.
4. Research studies contributing to the development of a national export strategy conducted.
5. Public-private dialogue for a coherent national export strategy is fostered.



For further information about the ITC implemented Component 1 and the TRTA-II programme visit: <http://trtapakistan.org>