Regoverning Markets

Small-scale producers in modern agrifood markets

Innovative Practice

Pakistan
A case study of milk production and marketing by small and medium scale contract farmers of Haleeb Foods Ltd

Tanvir Ali
University of Agriculture Faisalabad

www.regoverningmarkets.org

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Regoverning Markets is a multi-partner collaborative research programme analysing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle- and low-income countries. The aim of the programme is to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of the dynamic changes in local and regional market**s**.

Innovative Practice series

Innovative Practice is a series of country case studies from the Regoverning Markets programme providing examples of specific innovation in connecting small-scale producers with dynamic markets at local or regional level. Based on significant fieldwork activities, the studies focus on four drivers of innovation: public policy principles, private business models, collective action strategies by small-scale farmers, and intervention strategies and methods of development agencies. The studies highlight policy lessons and working methods to guide public and private actors.

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Acknowledgments
This piece of research is a team effort and the author owes a debt of gratitude to all those who helped in field data collection, especially Mr. Tahir Mahmood, Muhammad Iftikhar, and Mr. Farrukh Awan, conducting a review of literature, and writing the manuscript.

The author is thankful to the donors for their funding support through IIED and SDPI, which made this study possible.

Sincere thanks are due to a number of people and institutions that contributed to the success of this work. The author expresses the deepest sense of gratitude to Mr Abid Qayyum Suleri and Mr. Sajid Kazmi of SDPI for timely monitoring and feedback.

Funding for this work was provided by:
UK Department for International Development (DFID)
International Development Research Centre (IDRC), Ottawa, Canada
ICCO, Netherlands
Cordaid, Netherlands
Canadian International Development Agency (CIDA)
US Agency for International Development (USAID).

The views expressed in this paper are not necessarily those of the funding agencies.

Citation: Tanvir, A (2007) *Pakistan: A case study of milk production and marketing by small and medium scale contract farmers of Haleeb Foods Ltd*, Regoverning Markets Innovative Practice series, IIED, London.

Published by:
Sustainable Markets Group
International Institute for Environment and Development (IIED)
3 Endsleigh Street
London WC1H 0DD
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Tel: +44(0)20 7388 2117, email: sustainablemarkets@iied.org

Cover design: smith+bell

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1. Executive summary

The livestock sector plays a vital role in the economies of many developing countries. It provides food or, more specifically, animal protein in human diets, income, employment and possibly foreign exchange. For low-income producers, livestock also serves as a store of wealth, provides draught power, and organic fertilizer for crop production and can even be a means of transport. Milk provides relatively quick returns for small-scale livestock keepers and smallholders produce the vast majority of milk in most developing countries. It is a balanced nutritious food and is a key element in household food security.

In Pakistan, the livestock sector as a whole plays a crucial role in the country's rural economy and within this sector milk is the largest and single most important commodity. Pakistan is the fourth largest milk producer in the world and the importance of the country's dairy sector can be judged from the fact that in terms of market value, its contribution to Gross Domestic Product (GDP) surpasses all the major crops. During 2002-2005, milk and milk products worth US$10,167 million were exported from Pakistan.

In spite of the above, there is a dearth of research and documentation regarding the dairy sector in Pakistan. No serious effort has been made to understand the dynamics of this important sector. Furthermore, Pakistan's dairy industry is plagued by a number of problems which include: a lack of commercial dairy farms, low productivity, weak infrastructure, a lack of financial facilities, and the ready availability of raw milk to a poor and uneducated population. The current process of collecting milk from a large number of subsistence farmers is time-consuming, costly and prone to adulteration. The government, after initially ignoring the dairy sector, has now realized its importance and embarked upon a number of initiatives to boost the sector. Under the new programmes, the Pakistan government has created the National Dairy Development Board (NDDB) and Livestock & Dairy Development Board (LDDB).

In Pakistan only 3-4 per cent of total milk is currently processed and marketed through formal channels. The remaining 97 per cent of milk reaches end users for immediate consumption through an extensive, multi-layered distribution system of middlemen. More than half of this milk collected by urban traders and processing industries comes from small herd families. These farmers can usually sell either to middlemen such as *gavalas* (local milk collection, transportation, and distribution people), to shops, or direct to the (usually rural) consumer. The farm gate price of milk ranges from PKR[1]8 to PKR16 per litre. This variation is not linked to the quality

[1] Pakistani Rupee.

of the milk but is rather determined by the financial arrangement between the buyer and seller and geographical location. Currently, there are no policies to regulate milk prices at the farm level. In consequence, the market forces operating in a totally unregulated environment are exploiting the poor farmers by offering low prices for their produce.

This case study examines Haleeb Foods Ltd. (HFL) a milk processing and marketing company that purchases its raw milk from small and medium scale producers. Haleeb Foods is at the forefront of product and packaging innovation. It has achieved market leadership in several food categories with a very strong portfolio, consisting of leading national and international brands. It is the fastest growing packed food company in the country; in 2005, the company reported an annual turnover of PKR7.2 billion. HFL has acquired various international quality and environment certifications, including ISO 9001-2000, HACCP and ISO 14001 (EMC).

The purpose of the study was to generate policy-relevant research and to identify HFL's innovative marketing practices using qualitative research techniques. A team of three researchers was trained in qualitative data gathering techniques and supervized by a senior researcher who gave back-up support. Key informants were identified in several scoping visits and were interviewed in ensuing visits. Observations were also conducted at milk collection centres and milk quality testing laboratories. Field data were collected from Pakpur zone and the main plant site of Chenab Nagar, Kasur.

The main characteristic of the marketing innovation of HFL was the exclusion of big milk contractors from the supply chain in the late 1990s. The big contractors were used to blackmail the company on one hand and the small-scale milk producers on the other. Therefore, the company decided to exclude the big contractors and started a policy of self-collection. This strategy saved the company from collapse by ensuring the sustainable involvement of small milk producers in the market chain.

Another very important aspect of HFL's innovation is its strict and stringent quality policy regarding the intake of raw milk. At every Plate Heat Exchanger (PHE) plant, rigorous quality tests are conducted to ensure that only fresh milk of the highest quality is accepted at the plant premises. These tests have led to a reduction in milk adulteration by the producers/suppliers and consumer confidence in HFL products is high as a result.

These and other evolutions in the supply chain have led to the sustained inclusion of small farmers. The establishment of quality standards has ensured better marketing of the processed milk. The smallholders have had no problem selling milk, receiving a higher price for it than from other milk processing companies and they are now safe from blackmailing by big contractors who also paid less money per unit milk.

On the other hand, inclusion is not very appreciable if examined from the point of view of any backward or forward linkages. The company does not provide any technical or other assistance to the farmers, especially the small farmers. This has a serious limiting affect on the growth of small farmers, as they seem destined to remain small subsistence farmers with no chance to rise up the supply chain. Also, farmers are still potentially vulnerable to unfair or fraudulence behaviour from the independent middlemen who collect the milk from the farm gate. For example, although HFL pays its agents and contractors in advance for milk supplied, these middlemen sometimes only pay the farmers a fortnight after delivery.

Another serious issue is the absence of any formal or even informal farmers' organization, such as a milk producers association. Across most other major dairy-producing countries, dairy farmers are organized into their own associations, which support farmer training and management, enable investment in infrastructure and provide support services. Due to the absence of any such association, farmers are unable to bargain collectively with the HFL or any other company procuring milk from their area.

In conclusion, it was found that although milk production systems prevailing in Pakistan were plagued by lower milk yields, they offered immense potential for growth. Changes in animal management and basic animal feeding practices, especially by small dairy farmers, could substantially increase milk yields. Sustained effort on the part of the government and the private sector is needed to improve animal stocks and feed, management practices, and production technologies in order to harness the immense potential of this important livestock sector, in view of its contribution to GDP.

Private companies engaged in milk collection and procession could help farmers to: upgrade supply chains by facilitating investment in chilling tanks for purchasing and collecting of milk, which would give farmers a guaranteed sale for quality milk; improve the quality of feed to ensure a better quality of milk in the form of advances tied to procurement of better feed; and demonstrate the health and safety problems associated with poor quality milk that would increase the potential sale of processed milk and milk products.

The government could: improve and enforce existing food safety standards in line with international standards; provide practical training to farmers on modern farming practices; raise capacity of training institutions to provide required training and qualifications; and investigate modern technologies, systems, and underlying seasonal economics of dairy production to better inform investment decisions and correct market distortions.

Finally, on a social level, attempts to enhance production of smallholder dairying are important not only for raising milk yield in the country but could also become an effective tool for raising income levels of impoverished rural households. Successful interventions in this type of dairy farm could be the key to alleviating poverty in rural areas.

2. Introduction

The livestock sector plays a vital role in the economies of many developing countries. It provides food (specifically, animal protein) in human diets, income, employment and possibly foreign exchange. For low income producers, livestock also serves as a store of wealth, provides draught power and organic fertilizer for crop production and can even be a means of transport. Consumption of livestock products in developing countries, though starting from a low base, is growing rapidly.

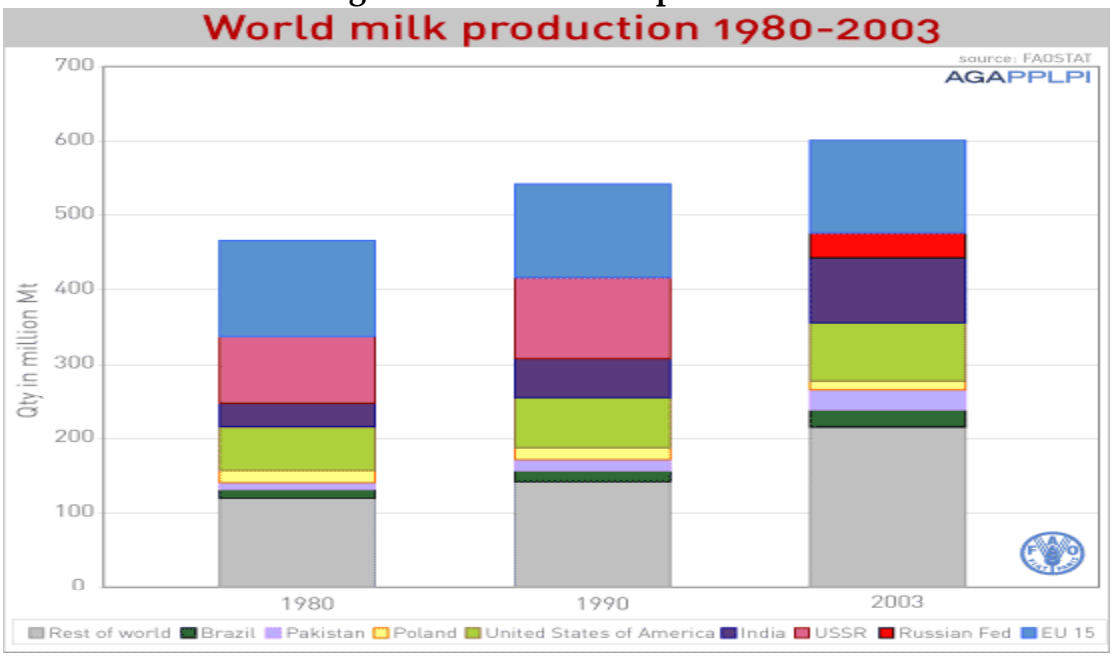
Milk provides relatively quick returns for small-scale livestock keepers. It is a balanced nutritious food and is a key element in household food security. Smallholders produce the vast majority of milk in developing countries where demand is expected to increase by 25 per cent by 2025.[2] Dairy imports to developing countries have increased in value by 43 per cent between 1998 and 2001. Over 80 per cent of milk consumed in developing countries (200 billion litres annually) is handled by informal market traders with inadequate regulation.

2.1 World milk production

Two thirds of total world milk is produced by Brazil, India, Pakistan, Poland, the Russian Federation, the USA, and 15 EU member states. Figure 2.1 shows Pakistan's share in the total production of the world according to which, Pakistan is the fourth largest milk producer in the world.

[2] http://www.fao.org/ag/AGAinfo/subjects/en/dairy/home.html accessed on Aug. 6, 2006 at 15:00

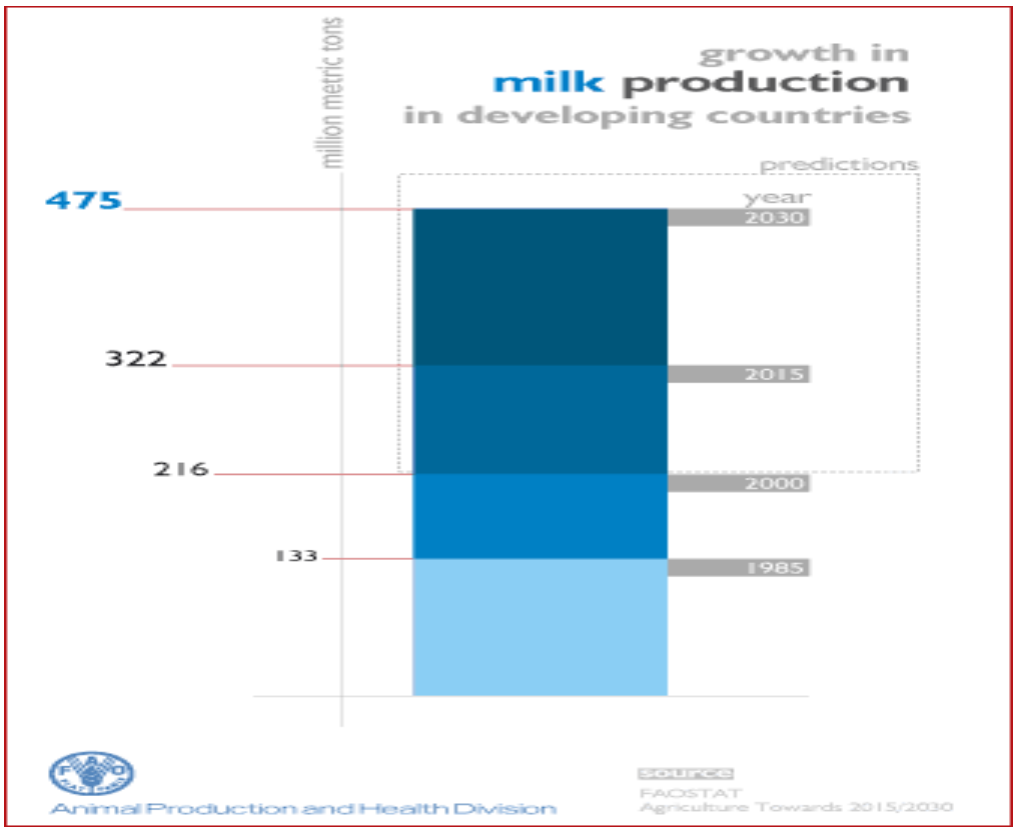
Figure 2.1: World milk production



2.2 Growth in milk production in the developing countries

In the previous table, we saw the total world milk production was about 600 million metric tonnes. Developing countries produced one third of total world milk production in 2000 (216 million metric tones) and this is increasing. According to FAO estimates, it is projected to reach 475 million metric tonnes in 2030. Figure 2.2 gives projected estimates of growth of milk production in developing countries.

Figure 2.2: Projected growth in milk production in developing countries by 2030



2.3 World milk production by type of milk

Various animals including buffalos, cows, sheep and goats produce milk. Total world milk production is dominated by cows' milk followed by buffalo, goat and sheep. According to FAO estimates, out of the total milk production in 2001, cows' milk accounted for 84.6 per cent of the total world milk production followed by buffalo milk (11.8 per cent), goat milk (2.1 per cent) and sheep milk (1.3 per cent). Table 2.1 gives details of world milk production by animal categories.

Table 2.1: World milk production in 2001

	Thousand million litres	Percentage of total
Cow milk	494.6	84.6 per cent
Buffalo milk	69.1	11.8 per cent
Goat milk	12.5	2.1 per cent
Sheep milk	7.8	1.3 per cent
Other	1.3	0.2 per cent
Total	585.3	100.0 per cent

Source: F.I.L. - F.A.O.- U.S.D.A.[3]

[3] http://www.japy.com/htmlgb/lait/monde.htm visited on Aug. 6, 2006 at 16:10

3. Review of Literature

There is a dearth of research and documentation regarding the dairy sector in Pakistan. No serious effort has been made to understand dynamics of this important sector. Its importance could be judged from the fact that in terms of market value, its contribution to Gross Domestic Product (GDP) surpasses all the major crops. Burki et al (2005), Abedullah and Sabir (2005), Lohano & Soomro (2006) and Garcia et al (2003) are some of the notable studies that look at various aspects of dairy sector in Pakistan in a systematic fashion.

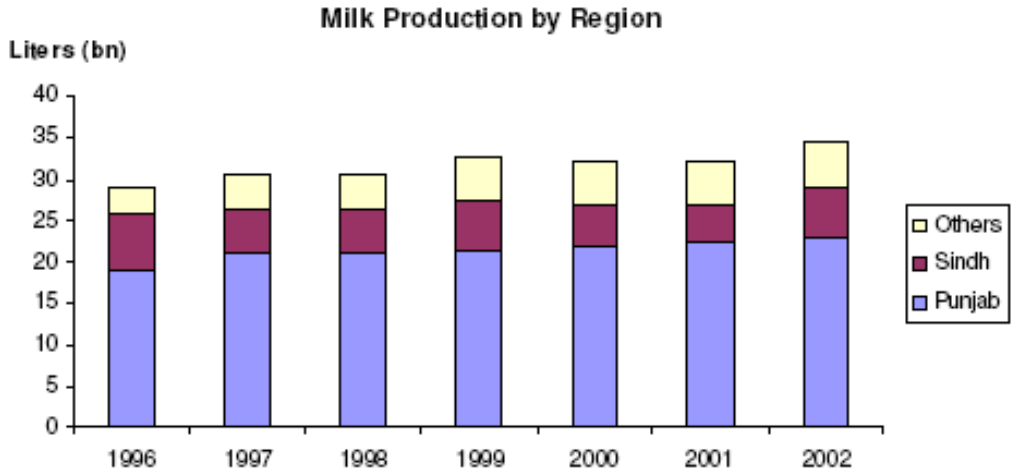
Burki et al (2005) provided a preliminary assessment of the state of Pakistan's dairy, explored the sector's potential in making impact on the dairy economy and recommended areas where more detailed research work is needed. Future projections were made using the Autoregressive Integrated Moving Average (ARIMA) model. The study forecast fresh milk to increase to 37,670 million metric tons and that of Ultra Heat Treated (UHT) milk to expand by 754 million metric tons by 2009-10. They found that even though milk production systems prevailing in Pakistan are plagued by lower milk yields, they offer immense potential for growth in the short to long term. Changes in animal management and animal feeding practices, especially by small dairy farmers, could be instrumental in raising milk yields in the short term. They believe attempts to enhance the production of smallholder dairying are not only important for raising milk yield in the country; they could also become an effective tool for raising incomes of impoverished rural households. According to the authors, further research on production structures in dairying could help identify the structural changes needed in this sector.

Lohano and Soomro (2006), using historical time series data in the Random Walk Model with the drift trend-stationary autoregressive model, forecast the annual milk production to grow by 4.17 per cent per annum. Their results indicate that shocks to production in a year have a permanent effect on the level of future production.

Abedullah and Sabir (2005) looked at the competitiveness and efficiency of milk production in central Punjab and find that small farmers hold about 38 per cent of the total numbers of milk-producing animals. Smallholders with less than or equal to 12.5 acres of land possess more than 73 percent of dairy animals. The authors found that social profits were generally higher than private profit. They also found that technical inefficiency of milk and livestock production was highest in the district of Jhang, followed by Faisalabad and T.T. Singh is technically the most efficient of the three districts of central Punjab while in the Jhang district technical inefficiency was the main source of variation in total income (income from milk production + income from inventory sale). They recommended extension department to play a central role

in guiding the farmers to solve livestock production-related problems and they also recommended that the government take steps to improve the marketing system.

Figure 3.1: Milk production by region in Pakistan



Source: IFCN, 2003.

Figure 3.2: Milk production by type and region in Pakistan

Year	Milk production (million tonnes)		Milk production by regions (million tonnes)		
	Buffalo	Other	Punjab	Sindh	Other
1996	18	9	19	7	3
1997	20	9	21	5.5	4
1998	20	9	21	5.5	4
1999	21	9.5	21.5	6	5
2000	21.7	10	22	5	5
2001	21.8	9.5	22.5	4.5	5
2002	23	10	23	6	5.6

Source: IFCN (2003)

Garcia et al (2003) assessed the economics of dairy farming in Pakistan and gauged the prospects for improving dairy income for small-scale producers. They calculated the cost of dairying at the farm and household level and concluded that a dairy marketing system catering for the needs of small-scale producers would send a strong positive signal for the latter to mobilize their resources and develop their operations.

3.1 Milk production in Pakistan

Pakistan is the fourth largest milk producer in the world. About a third of the total milk produced by rural families is distributed to urban consumers and processing

industries. In urban areas milk is available to common consumers in two ways: loose/unprocessed milk and packed/processed milk.[4] Dairy companies such as Nestle and Haleeb are the main part of milk marketing structure. Haleeb Foods Limited (HFL) is local company that developed from a small structure.

Livestock sector in Pakistan contributes almost 50 percent to the value added in the agriculture sector, and almost 11 percent to GDP, which is higher than the contribution made by the crop sector (47.4 per cent in agriculture and 10.3 per cent in GDP). The livestock sector plays a crucial role in the rural economy since 30-35 million of the rural population of the country are engaged in this sector for their livelihoods. Within the livestock sector, milk is the largest and the single most important commodity.[5] Pakistan also has an industrial ice cream production capacity of approximately 47.5 million litres per year.

Pakistan's dairy industry is plagued by a number of problems which include: a lack of commercial dairy farms, low productivity due to poor nutrition, weak infrastructure, a lack of financial facilities, and the ready availability of raw milk to a poor and uneducated population. Although Pakistan was ranked fourth among the five leading milk producing countries in the world, with an estimated 24 million animals producing close to 28 million tons of milk in 2003 and over 31 million tons in 2005-06, its yield per animal is only one-fifth of that of western Europe.[6] The total annual milk production in Pakistan is shown in Table 3.1.

Table 3.1: Annual milk production in Pakistan

Fiscal year	Milk production (thousand tonnes)	Fiscal year	Milk production (thousand tonnes)
1990-91	15,481	1998-99	24,876
1991-92	16,280	1999-2000	25,566
1992-93	17,127	2000-01	26,284
1993-94	18,006	2001-02	27,031
1994-95	18,986	2002-03	27,811
1995-96	22,970	2003-04	28,624
1996-97	23,580	2004-05	29,438
1997-98	24,215	2005-06	31,294

Source: Pakistan Economic Survey 2005-06

It is clear from the data presented in Table 3.1 that the milk production in Pakistan has almost doubled over the last sixteen years whereas the population has increased from 112.11 million to 153.96 million over the same period. About 55 per cent of the milk produced is consumed in rural areas. Farms are small, and most farmers own

[4] Consumers International Asia Pacific Office, 2006

[5] Govt. of Pakistan, Economic Survey 2005-06

[6] FISDA-USAID, 2006

an average of two to three animals. The lack of any efficient collection system, or refrigeration and transportation facilities results in wastage. However, milk-processing companies are trying to establish infrastructure at a local level to ameliorate the situation.

3.2 New government initiatives

The government, after initially ignoring the dairy sector, has now realized its importance and embarked upon a number of initiatives to boost the sector. Under the new programmes, the Pakistan government has created the National Dairy Development Board (NDDB) and Livestock & Dairy Development Board (LDDB).

3.2.1 Strategy Working Group (SWOG) and Dairy Pakistan Company[7]

The Ministry of Industries, Production & Special Initiatives established a Strategy Working Group (SWOG) on dairy to chalk out a strategy and suggest institutional arrangements for promoting the dairy sector in the country. The SWOG recommended the establishment of Dairy Pakistan Company on the lines and model of Dairy Australia. The prime minister approved the establishment of Dairy Pakistan in order to bring about a 'white revolution' in the country.

3.2.2 FAO Technical Assistance for up-scaling dairy development in Pakistan

In April 2005, The Ministry of Food, Agriculture and Livestock (MINFAL) signed three Technical Assistance Projects Agreements (TA) with the Food and Agriculture Organization (FAO) of the United Nations. The total value of these TA is US$1.99 million (PKR117 Million). The FAO will provide assistance to the MINFAL under its technical cooperation programme (TCP) for Up-scaling Dairy Development in Pakistan and this TA is worth US$354,000. The "Assistance in Up-scaling Dairy Development in Pakistan" is intended to develop the livestock and dairy sub-sector to provide safe and affordable milk and dairy products to consumers.

This project is to support MINFAL's strategies to transform subsistence agriculture into value-added agriculture through agro-processing and agribusiness enterprises by small-scale, resource-poor farmers and livestock smallholders. As part of MINFAL's pro-poor agricultural strategies and poverty reduction programs, this project will assist the National Dairy Development Board to promote private-public partnerships, improve milk collection and marketing by up-scaling successful models such as HALLA, and develop milk processing for products of consumer

[7] For detailed objectives of the Dairy Pakistan Company, see Appendix 1

demand, such as cheese, yoghurt and butter.[8] It will prepare a "roadmap" for adoption of improved food safety standards for milk/dairy products.

Box 3.1: Dairy Pakistan

Dairy Pakistan is a public-private sector joint initiative to bring about structural long-term change in the dairy industry in Pakistan. With a vision to turn Pakistan into one of the top five dairy manufacturing countries in the world, Dairy Pakistan is embarking on a phased plan targeting all the key players in the dairy sector. Dairy Pakistan is chartered to coordinate, manage and facilitate all initiatives leading to the development of the dairy sector in the country.

Dairy Pakistan is a company set up under section 42 of the Companies Ordinance, 1984 and was incorporated as Pakistan Dairy Development Company on the 9th September 2005. The establishment of Dairy Pakistan is a result of recommendations made by the Dairy SWOG (Strategic Working Group). SWOG is a body representing the major players and stakeholders in the dairy chain, including farmers, processors, marketers and the government. The project is principally financed by the government of Pakistan with additional private sector funding.

Dairy Pakistan had its first board meeting on the 30th of September 2005. Faisal Farooq, chairman of the dairy SWOG was elected as the chairman of the board. The first board meeting discussed the work plan; the budget for the first year and a schedule for release of GOP funding; the appointment of Tony Christiansen as interim CEO, the role of the SWOG as a "Group of Experts / Think Tank" for Dairy Pakistan and its board, and started the process of forming board committees. The SWOG core groups have continued to meet on each major pilot project and initiative and will work with Tony Christiansen and the professional staff that DP will hire.

Source: http://www.dairypakistan.com/pdsector.html

3.3 External trade in milk

During 2002-2005, milk and milk products worth US$10,167 million were exported from Pakistan. Over this period 162,278,4 litres milk, worth US$837,182 was exported to Afghanistan, Uzbekistan and Tajikistan. Condensed milk weighing 540kg and worth US$13,097 was exported to Afghanistan, Uzbekistan and Tajikistan. Milk toffee and milk cereals weighing around 359,184kg and valued at US$281,476,2 were exported to Saudi Arabia, Dubai, Afghanistan, Uzbekistan and Tajikistan. Milk cream and milk powder valued at US$391,243,8 were exported to Afghanistan, Tajikistan and Uzbekistan. Fresh sweets, biscuits and chocolates worth US$260,056,4 were exported to Saudi Arabia, Dubai, and Switzerland (Bosan, 2006).

Pakistan imports dry/powered milk from Eastern Europe and Centrally Independent States (CIS). Imports of skimmed milk powder range from 5 to 10 per cent of total milk powder imports. In 1998-99, Pakistan imported 7,000 metric tons of milk

[8] HALLA is a cooperative model and a group of small farmers who are currently part of Idara e-Kissan, a farmers' organization.

powder, costing US$16.5 million that year. Current trade estimates of milk powder imports are 12,000 metric tons, mostly from Eastern Europe and New Zealand, whereas annual consumption is 22,000 to 23,000MT. The share of imported milk powder in the domestic market for liquid and dried milk does not exceed two per cent.

3.4 Milk processing and marketing

In Pakistan only 3-4 per cent of the total milk is processed and marketed through formal channels whereas the remaining 97 per cent of the milk reaches end users for immediate consumption through an extensive, multi-layered distribution system of middlemen. However the processed milk consumption is growing at the rate of 20 per cent per year. Pasteurized and UHT milk in tetra packs are very popular products (PISDA-USAID, 2006). Most milk shops and bakeries across Pakistan manufacture and sell traditional dairy products like *dahi* (yoghurt) and *khoya* (sweet condensed milk).

Large dairy shops also produce *desi* ghee and butter. Processing plants have also introduced a number of dairy products like yoghurt, drinking yoghurt, flavoured milk, cream, butter, ghee, cheese and ice cream. However, the quantities sold are small except for yoghurt and butter. Industrial processing units have also been set up in addition to the traditional traders of sweetmeats, milk, yoghurt, ghee and other dairy products. Most processing capacity is concentrated near larger markets and away from potential sources of milk. More than 53 modern milk processing facilities were established before 1974. By 1974 less than half were operating after the introduction of the first UHT, long-life milk plant came into operation. Estimates of processing capacity in Pakistan are given below in Table 3.2.

Table 3.2: Processor capacity of various milk processing companies

Processors	Capacity (million litres)	Capacity utilization		Monthly average
		Flush	Lean	
Nestle	1.3	1.3	0.78	1.04
HFL	0.9	0.9	0.54	0.72
Millac	0.3	0.3	0.18	0.24
Vita	0.05	0.03	0.018	0.024
Halla	0.15	0.15	0.09	0.12
Prime	0.1	0.1	0.06	0.08
Nurpur	0.15	0.15	0.09	0.12
Nirala	1	0.1	0.06	0.08
Dairy Crest	0.15	0.15	0.09	0.12
*Engro	0.35	0	0	0
K & K	.04	0	0	0
Butt Dairies	0.04	0.06	0.036	0.048
Munno Dairies	0.06	0.02	0.012	0.016
Khi Dairies	0.1	0	0	0
Military Dairy Farms	0.18	0.18	0.105	0.144
Total	5.21	3.44	2.064	2.752

*planned Source: SWOG estimates

3.5 Milk price

As a result of the complex collection and distribution system, the current milk quality in Pakistan is below international standards. The average farm gate price of milk is PKR10 per litre. It varies from PKR8 to PKR16 per litre depending upon the season.[9] Apart from seasonality, variation of farm gate price is not linked to the quality of the milk but is rather determined by two factors. One is the financial arrangement between the buyer and seller. The second factor is the geographical location. In areas where livestock rearing is difficult due to very hot weather or scarcity of fodder like in Rawalpindi, farmers get a better price for their milk. But when the price of the fodder is taken into account, the net income of these farmers is not significantly higher than the income of farmers from other areas of Punjab. Currently, there are no policies to regulate milk prices at the farm level. The middlemen, contractors, *gawalas* (local milk collection, transportation, and distribution people) processors, processed unpacked milk, loose milk, and processed milk are the segments of the dairy value chain. The processed packed milk costs PKR44 per litre whereas the loose milk costs PKR24 per litre.

Around a third of the total milk produced by rural families is distributed to urban consumers and processing industries. More than half of the milk collected by urban

[9] The companies categorize milk collection in two seasons, flush and lean. During flush season, since there is a lot of milk available, prices go down and during the lean season, due to lack of fodder, milk production goes down and prices of milk increase.

traders and processing industries comes from small herd families. The family's decision to sell milk and the amount to sell is clearly poverty-driven; small farmers sell milk only because they have no other source of cash income. Milk in urban areas is accessible to common consumers in two ways: loose, unprocessed milk and packed, processed milk. Each has its own price regime.

The unprocessed milk passes through the 'middlemen' before it reaches the urban retailer. The price of milk increases by one rupee per litre at every stage of sale. The *dodhees* (*gawalas*) generally have undocumented contracts with farmers for regular milk supply. They pay farmers an average price of PKR10.74 per kg. Some *dodhees* have milk storage and chilling systems and transport systems. Transportation generally costs PKR0.50 to PKR1.0 per litre. *Dodhees* earn one rupee per litre.

Table 3.3: Market shares and prices for milk types[10]

Processed/raw	Type of milk	Market share (by volume)	Sale price (PKR/litre)
Processed milk	UHT tetra pack	4.98 %	32
	UHT poly pack	0.02 %	22
	Open pasteurized milk sold at milk shops	3.76 %	14-15
	Pasteurized pouch	0.24 %	20
Raw/unprocessed milk	Open milk sold at milk shops	0.98 %	18
	Open *gawala* milk	90.00 %	12-14
	Direct to home	0.02 %	15-18

Source: "Pre-feasibility Study: Milk Pasteurizing Unit", Small and Medium Enterprise Development Authority, SMEDA, April 2002

The urban retailers deliver milk door to door, by motorbike or sell it in a shop to consumers. Consumers pay between PKR18 to PKR28 per litre depending on the fat content of the unprocessed milk.

It was reported in the local press that the retailers of milk in Karachi city wilfully increased the price of milk by PKR2/kg and it was being sold at a new price of PKR30/kg instead of PKR28.[11] This rate was enhanced last year while the city government official's rate was fixed at PKR22/kg. In March 2005 the former city *nazim*[12] imposed section 144 Cr. PC to ban overcharging of milk but this was maintained only for a month. Thereafter no other action was taken against these profiteers. Inhabitants of Karachi city were compelled to purchase milk at higher

[10] Data is out-of-date, as no recent document figures are available. Current market price of UHT tetra pack has gone up to PKR44 for Haleeb Milk and almost the same amount for the similar products of other competitors.

[11] 'The News International', March 03, 2006

[12] Local Body elected representative equivalent to mayor as Karachi is a metropolitan zone.

rates. The milk retailers' plea was that this increase in prices was due to the extra cost in the price of fodder, shortage of cattle, fuel charges etc.

Dairy companies are also part of the marketing structure. Small local companies have milk supply contracts with *dodhees*. They have milk storage, chilling and pasteurization facilities and a network of milk shops in the cities.

Farmers are forced to sell milk for cash income. But the market forces operating in a totally unregulated environment are exploiting the poor farmers by offering low prices for their produce. There is also no restriction on the quantity of milk that a company can collect from an area.

3.5.1 Margins

As mentioned earlier, Haleeb Foods were paying PKR18 per litre to the farmers in the areas where the survey was conducted. The commission agent who collects milk on behalf of HFL was paid PKR1 per litre. The company-packed UHT milk is being sold on the market at PKR44 per litre. The differential paid by the consumer as compared to what accrues to farmers is PKR 26. Not all of this goes to HFL. According to information from discussions with the field staff of the company, the company was paying PKR1 per litre to the collection agents and transportation costs from the collection centre to the PHE plant were PKR7/km in the case of a Hilux van owner and PKR11/km for a Mazda van owner with more capacity than the Hilux van. HFL officials also said the company was paying further transportation costs of PKR16/km to big vehicle owners to transport milk from the PHE plant to the processing plant. Company officials were not very forthcoming on cost issues so it could not be gauged how much was spent by the company on packaging.

There are no price controls in the wake of unlinking the magistracy system after the introduction of local government system under the country's devolution plan. Companies are given a free hand in charging enormously high prices for processed milk. They procure milk at 6.5 per cent fat content and supply milk to the consumers at 3.5 per cent fat content. Moreover, the companies also produce by-products through which they earn extra profits.

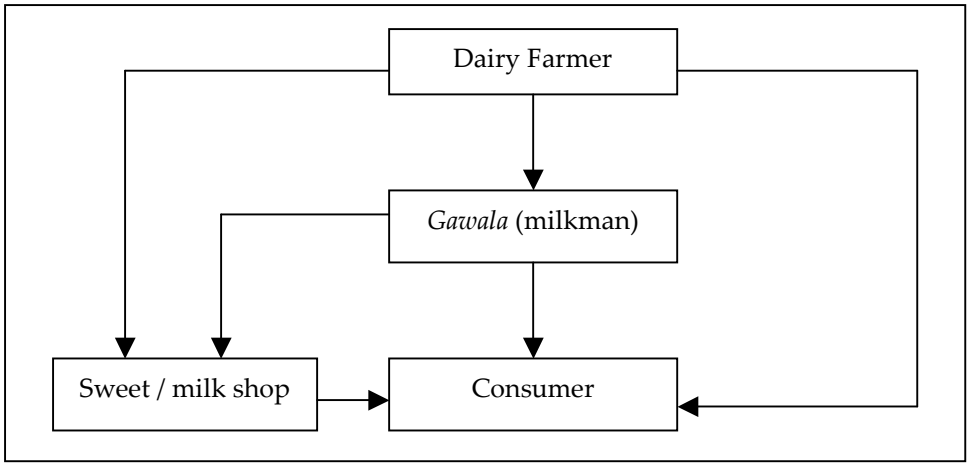
A high concentration of economic power in the late 1960s required a competition regime in Pakistan and eventually the central government enacted an Anti-Monopoly and Restrictive Trade Practices Law in 1970. This is called "the Monopolies and Restrictive Trade Practices (Control and Prevention) Law and an institution in the name of the Monopoly Control Authority (MCA) was formed. The broad objectives of the law are to provide measures against undue concentration of individual economic power, monopoly power and restrictive trade practices. The law spells out the situations deemed to constitute undue concentration of economic

power, unreasonable monopoly power and unreasonably restrictive trade practices. The law prohibits these clearly defined situations and collects information through the process of registration about these and other circumstances, which are likely to lead to such situations. In the case of milk, the MCA has not yet taken cognizance of the high price differential between fresh and processed milk.

Looking at the procurement prices paid by different companies to farmers, it seems that the companies have formed a sort of a cartel by way of which they are exploiting poor farmers and depriving them of gainful return on their produce. It is the task of the MCA to look into this issue as the MCA is mandated to take *suo moto* action if they are suspicious of any sort of collusion on the part of the companies.

3.6 Traditional milk supply chain

Figure 3.3: Traditional milk supply chain



Source: Author's own description

3.7 Existing legal framework for milk industry

Pure Food Rules of 1965, Cantonment Pure Food Rules of 1967 (for military areas), and parts of the Pakistan Penal Code of 1860 are applicable to the dairy industry along with the other food items. Legislative and regulatory measures that affect the milk market in Pakistan are dictated primarily by the salient features of laws governing the milk industry, including:

- All vessels containing any kind of milk intended for sale, distribution or storage must be labelled appropriately and visibly. In particular, metallic vessels (in which *gawalas* transport and deliver milk) must have a clear and distinct label attached to the vessel.[13]

[13] Section 18 of the Pure Food Rules, 1965

- Imperfect enamelling or imperfectly tinned vessels are illegal, as is the use of vessels that are at any time during the supply chain exposed to hazardous conditions, liquid or gaseous.[14]
- Milk from animals with any sort of disease is unlawful, as is milk drawn from animals less than thirty days prior to or ten days after parturition.[15]
- Any person with infectious or contagious diseases is disallowed from milking animals, working at a dairy farm, handling milk during transportation, or handling any vessel to be used for the storage or transport of milk.[16]
- Pasteurization parameters must be maintained, including a minimum heating of 143 degrees Fahrenheit for at least fifteen seconds, and immediate cooling to 4 degrees Fahrenheit. In addition, the coliform count has a ceiling level of 10 per ml.[17]
- Sterilization parameters must be maintained, including heating to 212 degrees Fahrenheit, passing of the Turbidity Test, and preparation under air-tight conditions.[18]
- Detailed lists are available of equipment and processes required for approval by the government to operate milk-processing plants.[19]
- The prohibition of using, or keeping at a retail premises any items that can be used to adulterate milk, including skimmed and condensed milk.[20]
- Provisions and process for executing the Turbidity Test by government functionaries on milk.[21]
- Definitions of milk, and milk products.[22]

The issue of adulteration of food and drink is dealt with in Sections 272 and 273 of the Pakistan Penal Code. The prescribed penalty for food adulteration is six months in prison, and/or one thousand rupees fine. Interestingly however, case law and legal interpretations of these sections of the penal code indicate that adulteration that does not lead to harmful effects is not liable under these sections. In addition, the mixing of water with milk does not constitute adulteration, and the explicit will to adulterate food must be inherent in the act for it to constitute a violation of the law. In most cases milk adulteration in Pakistan does make the milk harmful and unfit for consumption, however the likelihood of proving beyond reasonable doubt that the will to harm consumers is inherent in the act of milk adulteration is remote, by any account.

[14] Section 19 of the Pure Food Rules, 1965
[15] Section 20 of the Pure Food Rules, 1965
[16] Section 21 of the Pure Food Rules, 1965
[17] Section 22 of the Pure Food Rules, 1965
[18] Section 22 of the Pure Food Rules, 1965
[19] Section 23 of the Pure Food Rules, 1965
[20] Section 31 of the Pure Food Rules, 1965
[21] Appendix I of the Pure Food Rules, 1965
[22] Appendix 2 of the Pure Food Rules, 1965

3.8 Constraints to milk production in Pakistan

The dairy industry in Pakistan is constrained by a number of factors that include low genetic potential of animals, animal health, improper feeding and housing for animals, transportation and quality of milk. The lack of commercial dairy farms is also a limiting factor the dairy sector in Pakistan. The current process of collecting milk from a large number of subsistence farmers is time-consuming, costly and prone to adulteration. The main reasons for an underdeveloped dairy industry in Pakistan are described below:

1. Low genetic potential animals
The low genetic potential of local breeds of animals is one of the major constraints in increasing milk productivity. Any establishment of medium to large commercial dairy farms is seriously hindered by this constraint. No fruitful effort has been made to improve the breeding of cows and buffaloes towards becoming more efficient milk-producing animals. Even the purity of local breeds has been endangered through indiscriminate, unplanned cross breeding.

2. Improper feed
A large number of animals are grazed on marginal lands. Stall-feeding includes large amounts of wheat straw that has little nutritional value. Concentrate of feed use is very limited. Affordability of cattle feed is an important issue.[23] Dirty, non-potable and limited water is offered to the heat stressed animals thereby radically affecting their productivity. Milk yield per lactation is much lower than in many other countries.

Efficient feed resources are a key to livestock improvement. The provision of feedstuffs of adequate nutritional quality is the most important factor in increasing livestock production in the developing countries. Younas and Yaqoob (2005) reviewed the extent of feed resources available and their potential in meeting the animal needs and maintaining their health status. They dealt with the different aspects of fodder crops, concentrate feeding, range resources, non-conventional feed resources and nutrient requirements of farm animals.

3. Housing
Animal housing is a low priority area for the farmers. A large number of farmers cannot afford any housing for their animals, which are left out in all weather, especially in the heat.

4. Animal health

[23] This came out strongly during the Focus Group Discussions with the farmers.

Poor manure management and dirty water are the major sources of diseases and infections in the animals. The Livestock Department is responsible for disease prevention and cure of the animals. There is an acute shortage of funds in the government for dealing with such diseases, which ultimately lead to decreased animal productivity.

3.9 Characteristics of the small farmers and their problems

Most of the farmers contacted during the focus group discussions were small and medium sized farmers. The belonged to the small land holding group and were engaged in mixed farming systems. Din and Babar (2006) found that 81.6 percent of the dairy producers were small and medium sized.[24] They also found a positive correlation between landholding and herd size, as the size of landholding increased, there was an increase in the numbers of animals kept by the farmers.

During focus group discussion, farmers revealed that they kept small animals along with dairy animals that were fed on leftover or surplus feed of dairy animals. This stock acts as financial support when the farmer faces any monetary crisis and serves as a 'store of value' using the analogy from monetary economics. In any crisis and to cope with emergency situations, the small animals were the first to be sold in order to have ready cash.

Since the farmers were small and medium landholders, they did not have sufficient land to cultivate their own fodder. Respondents perceived fodder and land to be major constraints. Single dairy animal raising was another problem as it increased the cost of milk production (less profit) and made dairy farming discouraging. Grazing provides more than half of the feed requirement. Some green fodder and straw with a small quantity of concentrate are provided. This traditional system makes heavy demands on family labour.

The main constraint, which the milk producers seek to overcome by acting collectively, is the marketing of their product. The dairy farmers need to cooperate by establishing their own collection system and milk treatment facility in order to convert their perishable primary produce.

The other major constraints being faced by the farmers in the livestock enterprise were concentrate feeds, animal health, marketing of produce, animal purchasing and veterinary training. Besides favourable milk marketing strategies, small farmers were faced with other problems such as low winter prices, aggravated by the lack of

[24] They define small farmers as having 1-3 animals, medium farmers having 4-6 animals and large farmers having more than 7 animals. In their sample, small farmers were 38.3 per cent and medium sized farmers were 43.3 per cent.

facilities for the preservation and transportation of milk, limited access to credit and poor infrastructure. The poor condition of farm-to-market roads seriously constrained the delivery of agricultural inputs and market access. These factors limit the bargaining power of the smallholder in the dairy market.

3.9.1 Possibilities to support the organization of small milk producers

Interested NGOs can provide support and help raise awareness and mobilize small farmers to form producer organizations and to establish a milk pasteurization plant owned and operated by a producers' organization. Halla Dairies is one such example of a successful cooperative. Apart from these, multinational corporations and other multinational concerns have experienced more success. The examples from neighbouring India and Bangladesh speak volumes about the success of the cooperative movement that has benefited small farmers. Cooperative action is thought to increase sustainability and give producers improved bargaining power, due to the availability of an alternative outlet for milk sales.

4. Haleeb Foods Limited - historical perspectives

Haleeb Foods Ltd. (HFL) continues to be at the forefront of product and packaging innovation. It has achieved market leadership in several food categories with a very strong portfolio of leading national and international brands. It has also introduced a number of unique products, such as Haleeb milk, delicious traditional *lassi* (buttermilk) prepared with pure thick milk and yoghurt. HFL produces number one brands and is the fastest growing packed food company in Pakistan. The company reported an annual turnover of PKR7.2 billion for 2005. HFL was initially called Chaudhry Dairies Limited (CDL and first came into existence in 1984 as a small production unit in a decade when various dairy industries took a boost in Pakistan. The milk processing plant was installed at Bhai Pheru, District Kasur in 1985. It started its trials and commercial production started on May 21, 1986.

Haleeb Foods has segmented its product portfolio into three leading brands, Haleeb, Candia and Tropico. Haleeb has progressively diversified from UHT milk to other product categories as well. These product line extensions include Haleeb Butter, Haleeb Yoghurt, Haleeb Cream, Haleeb Labban (drinking yoghurt), Haleeb Asli Desi Ghee (butter oil), Haleeb Funday Juice Drink, Haleeb Skimz (skimmed milk), Haleeb N'rish Full Cream Powder Milk and Haleeb Good Day Pure Juices.

Haleeb Foods has a franchise agreement with Cedillac France and launched Candia Double Sterilized Milk in bottle format in April 1999. Candia is also available in Candia Classic variant which is positioned for tea. Another recent initiative is the flavoured milk for children, Candia Candy Up. The company also affiliated with CCF, Holland during 1989-90 for the production of a low fat milk product. The affiliation ended in 1991. In 1994, the name of the company was changed to Haleeb Foods Limited.

Haleeb Foods has one of the largest nationwide distribution networks delivering high quality products, even in the remote areas of Pakistan. With a network of over 1,100 distributors, the company ensures their product range is available in all the urban and semi urban areas of Pakistan.

4.1 International quality and environment certification

HFL has received the following quality certifications:

a. ISO 9001-2000: a series of standards published by the International Organization for Standardization to meet the growing needs for international standardization in quality. This certification was achieved in March 2003.
b. HACCP (Hazard Analysis Critical Control Point): a systematic and science-based approach to identification, assessment and control of food safety

hazards. From a practical point of view it is the most effective tool to prevent the occurrence of food-borne diseases and to avoid consumer injuries and illnesses linked to product consumption. HACCP identifies all types of hazards related to food. The company achieved this certification in June 2003.

c. ISO 14001 (EMC): a standard used to develop, implement and maintain a system with the help of environmental policy and documented procedures and records for the betterment of the environment in which organization exists by compiling the applicable environment and other regulatory requirements. HFL was recommended for this certification in August 2004.

4.2 Quality assurance

HFL has a strict and stringent quality policy regarding the intake of raw milk. At every PHE plant, rigorous quality tests are conducted to ensure that only fresh milk of the highest quality is accepted at the plant premises. The internationally recognized tests are used to check for a) adulteration, b) microbiological contamination and c) adequacy of nutritional contents.

Sampling of raw milk: ice is removed from the tanker and the milk is thoroughly mixed with the plunger for one to two minutes. Then the laboratory technician carries out the sampling with the help of a sampler, called a 'knoppy'.

Types of Sample:

1) Composite sample: this is a mixed sample taken from all the portions of the tanker in equal amount. The amount of composite sample is 900ml.
2) Separate Sample: this is a sample taken from a single portion of the tanker. The amount of separate sample is 600ml.

4.3 Tests performed at the HFL laboratories

The following tests are performed in the laboratory to check the quality and composition of the milk:

A. Organoleptic tests: this includes taste, smell and colour tests to check the suitability of milk for further processing or release into the market.

B. Qualitative tests: these are comprised of physical and chemical tests.

i) Physical tests: these tests have two further subcategories, namely temperature test and clots on boiling.

a). Temperature test - the raw milk sample should be less then 10^{o}C.

b). Clots on boiling (COB) – the milk is heated to boiling and if the milk precipitates in the test tube, the test is positive.

ii) Chemical tests: there are three types of chemical test, namely pH Test, Alcohol Precipitation Test and Salt Test.

a). pH Test - this is performed to judge the keeping quality of milk or to estimate the intensity of acidity/alkalinity of milk.

b). Alcohol Precipitation Test (APT) - this is performed to check the heat stability of milk during heat treatment. If precipitation occurs, the test is considered to be positive.

c). Salt Test - this is administered to determine the salt percentage (e.g. Na Cl) of the milk.

C. Quantitative tests: these tests include a Fat Test, LR Test and Iodine Value Test.

i). Fat Test: this is performed to determine the fat percentage in a milk sample to check if it conforms to HFL standards (i.e. 6%). It also forms the basis of payment to farmers.

ii). LR Test: this test is conducted to determine the percentage of SNF/total solids in a milk sample[25].

iii). Iodine Value Test (IVT): this tests the value of iodine in milk by a formula[26]. This is the most time-consuming test and is only carried out at the main plant.

D. Adulteration Test: milk is adulterated by mixing various things in it. HFL performs several tests to find out different adulterants. Tests include starch, sugar, glucose, detergent, urea, and sodium tests.

i). Starch test: the purpose of this test is to determine the starch adulteration in the milk. If black or dark blue granules are present, the test is positive.

ii). Glucose test: this is performed to test adulteration with glucose to increase the sugar content of the milk. If brick red precipitations are found, the test is positive.

iii). Detergent test: this test detects the harmful detergents used as adulterants. A pinkish colour shows that the test is positive.

iv). Sugar (sucrose) test: if a deep violet colour is present after 5-8 minutes, the test is positive.

v). Urea test: in this test milk is tested for the adulteration of urea as urea mixing increases the LR reading of the milk. A pink colour is a positive result.

vi). Sodium (Na) test: this is performed to determine sodium salt concentration in the raw milk. If the sodium ion concentration at 9% SNF is more than 1,000ppm, the test is positive.

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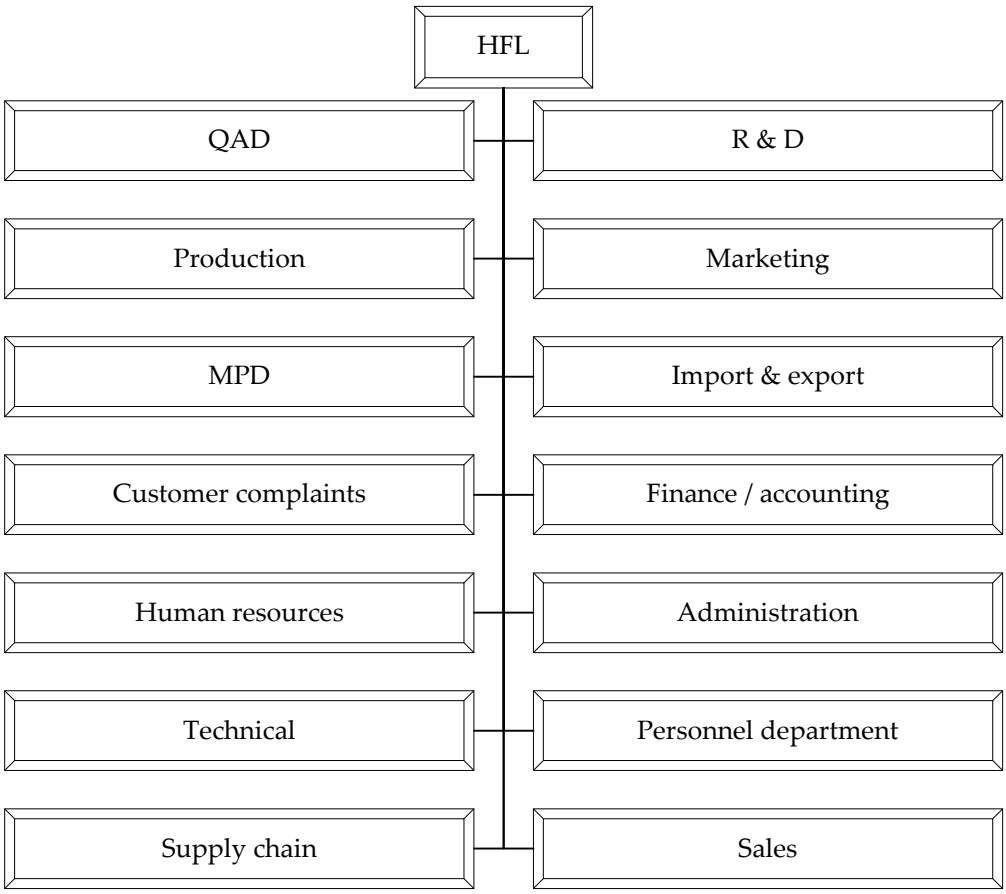
[25] % SNF = (LR/4)+(0.22XFat)+0.72; % Total Solids = % SNF + % Fat

[26] Iodine value = 1.269 [(a-b)/p], where: a = number of ml of 0.1 N sodium thiosulphate used in the blank test; b = number of ml of 0.1 N sodium thiosulphate used in the titration with the butter-fat present; and p = weight of butterfat taken for the analysis.

All these tests take about 30-40 minutes, except the iodine test, which takes 3-4 hours. If any of the tests are positive, the milk is rejected.

4.4 The organizational set-up

Figure 4.1: The organizational set up of HFL



4.5 Need for the case study

HFL is a local dairy company that has made considerable progress in milk processing and marketing in the country. Consumers know that its products (including packed milk) are available in almost all local food shops. The milk packed by this company is known to be thicker milk. Milk packs are available for smaller consumption. In view of the company's struggle to compete with the multi-national companies, a case study was deemed useful to examine the perceptions of various stakeholders and explore the marketing strategies used by the company to cope with the changing circumstances.

4.6 Objectives

i). To generate policy relevant research
ii). To identify innovative marketing practice of HFL

4.7 The research questions

The following research questions, identified by Berdegue et al (2005), were addressed in the study:

- What are the main characteristics of the innovation?
- How did the innovation emerge over time and how did its evolution lead to greater inclusion of small-scale farmers?
- What did the small farmers gain or lose?
- What are the reasons for the greater degree of inclusion?
- What is the potential for replication?

4.8 Assumptions

HFL's claim that it is making considerable progress in milk marketing and is the fastest growing packed food company in the country is true. In-depth qualitative rather than quantitative information was used to answer the research questions. Small contract farmers and the company staff were interviewed to gather information, details of which are given in the methodology section.

4.9 Limitations

The assumption that company staff would be willing to participate in the research process proved over optimistic. They showed much resistance and inability to participate in the interviews.

5. Methodology

The most common method of social science data collection is a survey based on a probability sample. The survey design for this study is quite complex to ensure equal probability of selection so that the findings can be generalized to a specified universe. The survey data is used for quantitative empirical analysis and its output is often precise correlations using various statistical tools. Theory drives such data to specify policy recommendations for government or business. Not all data analysis is, however, driven by theory that is so highly formalized. Thus, the data are also used via repeat analysis to establish empirical regularities, i.e. patterns in the data repeated across time or space that become part of social knowledge.

Although, the advantages of quantitative survey analysis are formidable, there are several drawbacks. The nature of information gathered by survey techniques is extractive and researchers are concerned with publishing findings based on the data collected.[27] At times, the quality of data is viewed as being poor since a detached expert through an unmotivated field team reflects upon the data and there is lack of bonding between the researcher and the field team. Another serious limitation of this method is when a structured questionnaire is utilized. It is assumed that the expert knows what is important and that is often not the case, and this happens when close-ended questions are used.

Due to these shortcomings of quantitative research, alternative research methods, focusing on qualitative information collection, have gained currency. These techniques are more popular because of the fact that they are cheaper and more sensitive to human behaviour. Some of these are pure anthropological such participant observation and other are quasi-anthropological such as RRA/PRA Rapid Rural Appraisal/Participatory Rural Appraisal (RRA/PRA). These techniques too have been critiqued for promising more than they can reasonably deliver.[28]

Since social science deals with human behaviour, which by its nature is unpredictable, there is no research method that would meet all purposes. However, the controversy over the use of various techniques has been valuable, as it has made social scientists more aware about the limitations of the information they collect, particularly if great care is not exercized in the process. This controversy compels researchers to use more than one kind of data gathering technique and that is the approach used in the present study, where both semi-structured and structured questions and other instruments such as observation-based field journals for field

[27] Robert Chambers, the PRA guru has criticized conventional social science research. He terms research as extractive if it is meant only to produce reports for donors and the subjects, i.e. the people who have been studied, get noting directly or indirectly.

[28] See Bastian and Bastian (1996) for a comprehensive critique of PRA practices.

reports, case studies and focus group discussions were employed to capture the nature of innovation.

As mentioned above, this study uses qualitative research techniques. A team of three researchers was trained in qualitative data gathering techniques, supervized by a senior researcher who gave back-up support. Key informants were identified in several scoping visits and were interviewed in the ensuing visits. Observations at milk collection centres and milk quality testing labs were also conducted. Field data were collected from Pakpur Zone and the main plant site of Chenab Nagar, Kasur.[29] Stakeholders such as mini-contactors, VMCC agents, small-scale dairy farmers and the local HFL staff were interviewed.

The areas selected for fieldwork were the districts of Jhang, Faisalabad, Toba Tek Singh and Bahawalnagar, since the bulk of the milk is produced in Punjab and within Punjab these districts are high milk-producing areas.[30]

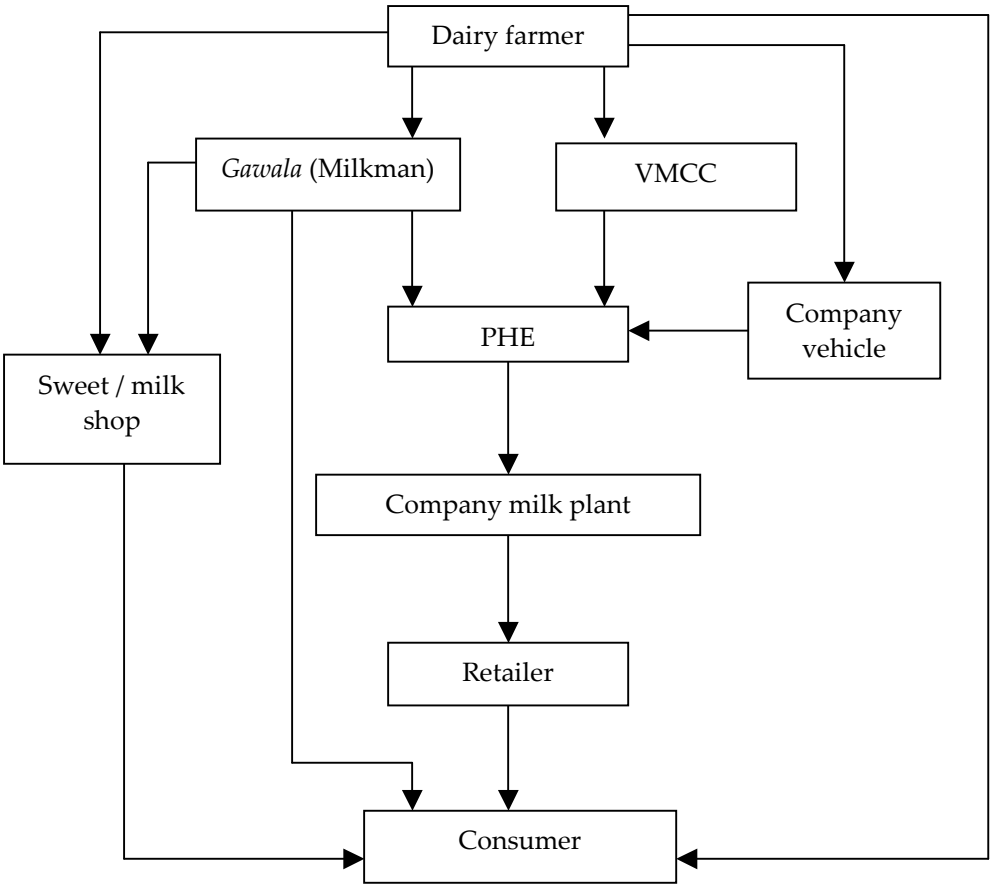
[29] Names of places have been changed to maintain anonymity.

[30] For details, see Abedullah and Sabir (2005)

6. Results and discussion

The Milk Procurement & Development Department of Haleeb Foods Limited is responsible for collecting milk in the area and maintaining an adequate supply of milk according to the quality standards and budget requirements of the company. There are two main milk collection seasons: flush season and lean season. In the flush season, which starts in September and ends in March, average milk collection is about 10-14 lac litres/day. In the lean season, from April to August, daily milk procurement is reduced to about 5-8 lac litres/day. The existing supply chain is depicted in Figure 6.1.

Figure 6.1: Existing milk supply chain



Source: Author's own description

6.1 Milk collection

There are two types of milk collection system adopted by HFL, self-collection and contract collection.

6.1.1 Self-collection

A system in which HFL purchases and preserves raw milk that meets its quality standards through their staff members and delivers it to the PHE plant is known as self-collection. It may include the following:

i). Milk Collection through the Village Milk Collection Centre (VMCC)
The Village Milk Collection Centre (VMCC) is a place where the farmers of an area come to sell their milk and a person appointed by the company collects the milk after testing it. This person who collects milk from the farmers is known as a VMCC agent. The VMCC agent provides all the essential utilities for the milk collection, such as the collection tub, testing chemicals, ice and location rent as well as the electricity bill. The agent keeps a record of all the farmers who supply milk to the VMCC and takes samples from the milk. The samples are tested and one copy of the test results is given to the farmer and another copy is kept at the VMCC for record. Farmers are paid weekly, i.e. after one week, farmers go to the bank and may withdraw the cash for all the week's supply from their account.

ii). Direct from Farmers (DF)
As the name indicates, this is a collection directly from the farmers. Some farmers do not use the VMCC. Instead, a collection vehicle goes to an area according to a specific timetable and the farmers supply milk directly to the vehicle.

iii). Progressive Farmers (PF)
Like direct farmers, progressive farmers supply milk directly to the collection vehicle but they are progressive farmers and provide higher quantities of milk.

6.1.2 Contract collection

In this system HFL deals with independent milk collecting persons, entering into a contract with them to provide milk to the company. They may include the following:

i). Mini contractors: are those who provide about 1,000 litres of milk per day. They collect milk through their own resources. In this type of collection, the company identifies personnel who are willing to work and are of good repute with fair dealings. The contract is mainly verbal and no written type of contract was observed during our survey. The mini contractor collects milk from the farmers in the area as well as from the other areas. Milkmen from different areas also supply milk to the mini contractor. An HFL vehicle then collects milk from these mini contactors. The personnel in that vehicle test the milk according to their quality standards. According to whether the milk passes these tests, it is accepted or rejected.
ii). Subcontractors: are similar to mini contractors but they transport milk to the company PHE plant themselves.

6.2 Milk procurement

The Manager Milk Procurement (MMP) plant is responsible for all the milk procurement in the milk area. The milk collection area, which mainly consists of the provinces of Punjab and Sindh, is divided into four regions each headed by an MMP. These regional offices are at Arifwala, Chishtian, Jhang and R. Y. Khan. Each region consists of three or four zones, with a total of fourteen zones spread over the four regions. Each zone is headed by an executive zone manager or an area executive, depending on the size of daily collection. Each zone consists of two or three sub-zones. The PHE (Plate Heat Exchangers) are located at sub-zonal level. The VMCC, mini contractors and sub contractors responsible for the milk collection are all organized within these sub-zones.

6.2.1 Milk collection area

The fourteen zones for self-collection of milk have twenty-eight main testing and processing centres (PHE).

Table 6.1: HFL milk collection areas

Number	Milk collection zones	Number	Milk collection zones
1	Arifwala	8	Pakpattan
2	Bahawalnagar	9	Okara
3	Bahawalpur	10	Rahim Yar Khan
4	Bhowana	11	Shah Jewna
5	Mian Channu	12	Narowal
6	Haveli	13	Upper Sind
7	Jhang	14	Lower Sind

Source: author's own survey

6.3 The innovation

The main characteristic of the marketing innovation of HFL was the exclusion of big milk contractors from the supply chain in the late 1990s. The big contractors used to blackmail the company on one hand and the small-scale milk producers on the other. It was reported in the field survey that the company had to face crises due to this blackmailing behaviour of the big contractors. Therefore, the company decided to exclude the big contractors and started a policy of self- collection. This strategy saved the company from crises by ensuring sustainable involvement of small milk producers in the market chain.

Another characteristic of the market innovation of HFL is the selection of VMCC agents from among small-scale milk producers. The agent provides interest-free

loans to the small producers whenever they are in need of money. The loan is provided against the personal guarantee that the producer will continue supplying milk to the agent in a sustainable manner.

HFL provides training for the agents in handling various milk quality tests to ensure the quality of the milk. The farmers (milk producers) are given causal informal information and guidance services regarding keeping the animal healthy and maintaining milk quality.

Another characteristic of the marketing innovation of HFL is the multidimensional procurement of milk. The company collects milk from its VMCC agents, mini contractors and farmers. One of the important characteristics of innovation includes upholding quality. There was a saying quoted in the field survey, "Better quality of the product leads to better marketing". HFL conducts some fifteen tests to ensure the quality of its milk. A description of some of these tests is given in section 4.3.

6.4 Emergence of the innovation

The innovation emerged over time. The company was established in 1984 and changed its name from Chaudhry Dairies Limited (CDL) to Haleeb Food Limited in 1994 when it developed its total quality system. The bottling plant was installed in 1998-99. At the same time the company decided to exclude big contractors from the milk supply chain, as they had become threat to the survival of both the company and the sustained inclusion of small dairy farmers. HFL established the Hazard Analysis Critical Control Point (HACCP) in June 2003. HACCP is a science-based approach for identification, assessment, and control of food safety hazards. It a very effective tool for preventing food-borne diseases and avoiding consumer injuries and illness linked to product consumption. This approach identifies all types of hazards related to food. The company received ISO 910-2000 certification in March 2003 and ISO 14001 in 2004. Thus, the system of establishing the quality of processed milk evolved over time from 1994 to 2004.

6.5 The implications of change

As the marketing innovation evolved over time it led to improvements in milk testing and increased staff numbers and also developed a sense of competition and financial gain. At farm and village level the technology developed were the milk testing units available with the agents. No other specific technological change was observed during the field survey.

The changes in technology such as the establishment of milk testing units (measuring fat percentage of the milk) have led, at agent level, to a reduction in milk

adulteration by the producers/suppliers. Ultimately, the smallholders developed confidence in the system as a sustained milk supply to the agents. The micro credit system, developed informally by the agents themselves, forced smallholders to remain in the system. It also has some negative aspects.

The form of inclusion of smallholders found in the system was "chain segment" meaning that the role of milk producers was primarily the milk production. There was no formal participation in post-farm activities. However, there were some informal activities such as interactions between the producers and HFL staff regarding training/guidance/information. The milk producers were not participating in the management of the supply chain.

6.6 Perception of small farmers

The evolutions of the supply chain have led to the sustained inclusion of small farmers. The establishment of quality standards ensured better marketing of the processed milk. The smallholders had no problem of selling milk especially in winter season when enough milk is produced. They are now safe from the blackmailing of the big contractors who paid less money per unit milk. The major attribute that explains the inclusion of smallholders is the price that they receive from the VMCC agents. The HFL agent (VMCC agent) pays at least PKR 0.50/litre more than the price agents/staff of other milk processing companies' pay to small-scale dairy farmers.

Inclusion, if viewed from the point of view of any backward or forward linkages, is not very appreciable. The company does not provide any technical or other assistance to the farmers, especially small farmers. This has serious limiting affect on the growth of small farmers, as it seems that they must continue to be small subsistence farmers with no chance to rise up the chain. They might even be excluded as the concept of VMCC is problematic. Since the VMCC agent is not on the company's payroll, he becomes another intermediary content to earn his commission by meeting his collection targets. Officially, the VMCC agents are paid 0.50 to 0.75 paisas per litre of milk collected, but since the farmers are not in direct contact with the company, they might get cheated in terms of the price of milk that they sell to the VMCC agents.

6.7 Topics that were discussed at Focus Group Discussions (FGD)

During the fieldwork, eight focus group discussions (FGD) were held at various locations with farmers and five key informant interviews were carried out with

Haleeb company officials. Four mini contractors were also interviewed.[31] The following topics came under discussion during these FGDs:

- Yields and production of milk, last season and five years ago
- Costs for milk production (including inputs, equipment, labour)
- Transportation cost, if any, this season and five years ago
- Quality control by the company
- Terms and conditions of the contract
- Selection criterion to select farmers/suppliers
- Modes of payment
- Advance given by the company
- Monitoring of the contract
- Contract enforcement
- Nature of the contract
- Implications for the breach of the contract
- Arbitration mechanisms in case of any disputes
- Supply of milk and daily targets
- Technical assistance in the form of inputs, such as credit to buy
- Any other form of assistance to improve soil to grow fodder
- Any type of training, especially veterinary training
- Presences of farmers' organizations, e.g. milk producers association, formally or informally
- Functions of the association
- Services provided by the association to its members
- Marketing channels
- Price and volume per channel
- Changes in the value of the product

The respondents stated that, on average a buffalo yielded eight to thirteen litres of milk depending on the feed. If good feed was provided, yield was on the higher side and vice versa. Cost of milk was reported to have increased due to inflation that also affected everything else, including inputs. There was somewhat mixed response about the quality control maintained by the company. Some of the respondents were of the view that since Haleeb was not a good paymaster, the Haleeb officials were compelled to compromise on quality. However, company officials unanimously reported that they were very strict about quality and employed state of the art technology to ensure quality of the milk procured from various channels.

Company officials stated that quality and regular supply were the sole criterion for selecting suppliers. VMCC agents ensured quality on the behalf of company and then the milk procured by each VMCC agent had to pass quality checks at the PHE

[31] Anonymity of the respondents is maintained so that they are not penalized.

plant. The company paid VMCC agents and mini contractors in advance, according to the volume of milk supplied. However, the VMCC agents had their own payment arrangements with the farmers. Sometimes, farmers too were given advance payment and in other cases, VMCC agents paid farmers after a fortnight.

The nature of contract used at various levels was also probed and it was found that there were no formal written contracts at any level. In the case of breach of contract by any party, the conflict was resolved through traditional arbitration methods. The company maintained a list of suppliers and continuously monitored their behaviour and if somebody was repeatedly found indulging in adulteration or any other type of cheating, the contract was cancelled and in some cases, payment was also withheld. There were daily targets of milk collection agreed upon between the company and the suppliers and these targets were somewhat flexible on a daily basis. The company officials reported that they had to meet monthly collection targets but targets were more flexible on a day-to-day basis.

It was reported during the FGD that there was no technical assistance from the company to farmers. The only technical assistance that was provided by the company was to the VMCC agents regarding the quality of milk. The company officials reported that the company was currently planning to hire veterinary graduates for the zone offices and these new officials would be able to assist farmers with the health of animals and other related issues. No other assistance was extended to the farmers in terms of credit supply to buy inputs or any other assistance to improve soil to grow fodder.

The respondents, when questioned about the presences of any formal or even informal farmers' organizations, such as a milk producers association, reported that no such organization existed. This was a serious issue and due to the absence of any such association, the farmers were not able to bargain collectively with the HFL or any other company procuring milk from their area.

Dairy farmers are not currently organized under a formal association. The Farmers Association of Pakistan (FAP) represents all farmers, but with a focus on cotton farming. In most other major dairy producing countries, dairy farmers are organized into their own associations. These organizations support farmer training, management, enable investment in infrastructure and support services. Research and quality related support services are more effective if farmers organize themselves and provide a platform.

6.8 Findings and recommendations

The purpose of the study was to generate policy relevant research and to identify innovative HFL marketing practice. The research questions revolved around the themes of characteristics of the innovation, emergence of the innovation over time and how its evolution has led to inclusion/exclusion of small-scale farmers.

The topics that came under discussion were the market channel choices available to small farmers, the return on their produce, backward/forward linkages, if any and quality issues in milk collection. The author found that there was no evidence of backward/forward linkages. The main issues for small farmers were the increasing cost of milk production, animal health and feed and marketing information.

It was found that although milk production systems prevailing in Pakistan were plagued by lower milk yields, they offered immense potential for growth. Changes in animal management and animal feeding practices, especially by small dairy farmers, could be instrumental in raising milk yields. Sustained efforts on the part of the government and the private sector are needed to improve their animal stocks, management practices, and production technologies. Most dairying households belong to subsistence or near subsistence category, so they have high stakes in dairy production since the dairy income often supplements their farming or labour income. Therefore, attempts to enhance production of smallholder dairying are important not only for raising milk yield in the country but could also become an effective tool for raising income levels of impoverished rural households. Successful interventions in this type of dairy farm could be the key to alleviating poverty in rural areas.

Our analysis shows that milk yields in Pakistan are very low, and even simple management of feed can increase yield substantially. Interventions are needed to harness the immense potential of this important livestock sector, in view of its contribution to GDP.

Farmers require knowledge enhancement regarding better feed management and this could be achieved by involving private sector companies engaged in milk processing and provincial livestock departments who could provide training and extension services to dairy farmers.

The feed industry must also be developed to produce better quality animal feed at affordable prices. There is a serious shortage of high quality feed including nutrients and additives, especially in rural areas. Public-private partnership to encourage the development of a modern feed industry is highly recommended.

Our analysis shows the animal stock of Pakistan is of poor quality. Although, better feed would increase yields, a better stock of animals would render the dairy sector commercially viable. Artificial insemination facilities should be cheap enough to make them affordable for small farmers. The government could provide easy credit for better quality livestock.

The dairy industry in general is constrained by low productivity, seasonality in milk supply, fragmented distribution system, lack of mechanization, automation and refrigeration, and unhygienic handling, leading to poor quality milk, well-below international standards.

Private companies engaged in milk collection and procession could help farmers to: upgrade supply chains by facilitating investment in chilling tanks for purchasing and collecting of milk, which would give farmers a guaranteed sale for quality milk; improve the quality of feed to ensure a better quality of milk in the form of advances tied to procurement of better feed; and demonstrate the health and safety problems associated with poor quality milk that would increase the potential sale of processed milk and milk products.

The government could: improve and enforce existing food safety standards in line with international standards; provide practical training to farmers on modern farming practices; raise capacity of training institutions to provide required training and qualifications; and investigate modern technologies, systems, and underlying seasonal economics of dairy production to better inform investment decisions and correct market distortions.

Based on the profit margins, which are seemingly very high, it could be recommended that there should be some monitoring by the government as to why the companies are earning supernormal profits. Due to this practice, there are two groups affected, initially the farmers who are not getting fair prices for their output and the consumers who have to pay a high differential as compared to the milk available from the informal channel. Although, there are quality differences between the UHT Tetra Pack milk and the fresh milk, yet the difference in the price is too stark. And this was the reason forwarded by people in response to the question as to why the consumers still preferred fresh milk over the UHT treated milk. Only a small percentage of the total market is shared among the various processing companies and bulk of the milk is supplied by the informal sector. By giving reasonable price to the farmers and by extending additional services like input support and veterinary services to farmers, companies could help farmers to include them in the supply chain and integrate them in the process.

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Appendix 1: Objectives of the Dairy Pakistan Company

The Dairy Pakistan Company has been registered with the Securities & Exchange Commission of Pakistan since the last week of September. The main objectives of the company, *inter alia*, are as follows:

a. To promote milk and other value added dairy products in the domestic and international market;
b. To promote the development and upgrading of the dairy supply chain in Pakistan by supporting and facilitating the farmers, processors and other stakeholders across the value chain;
c. To support dairy sector growth by supporting and facilitating business development services for the enterprises across the dairy value chain;
d. To initiate and support interventions across the dairy value chain to enhance sector competitiveness through innovations and research;
e. To promote technology development, transfer, assimilation, streamlining, acquiring and/or upgrading across the dairy value chain by undertaking new initiatives;
f. To help introduce international best management practices for better productivity and operational efficiencies;
g. To promote training and skills development of human resources associated with the dairy sector;
h. To help create an enabling/supporting/conducive business environment for enterprises operating in the dairy sector and propose new rules/regulations/bye-laws/standards for providing a level playing field and conducive regulatory environment for the development of sector and propose amendments thereof in any existing rules/regulations/bye-laws/standard in the sector and bring local industry in consonance with international standards.

The company has held two meetings of its board on October 01, 2005 and December 09, 2005. The following has been achieved so far:

a. Board HR and finance committees have been constituted to facilitate working of the board;
b. A bank account has been opened for the company and funds of PKR1 million have been credited to the company account;
c. The process of hiring the key positions has been initiated and is near completion;
d. Policy manuals for the employees and financial rules have been presented to the board for approval;
e. Premises has been identified for permanent office of the company and negotiations are in process for the acquisition of the same;

3. Various initiatives taken by the company to bring about a White Revolution in the country are briefly listed below:

a) Farm Cooling Tanks Loan Scheme:

A mechanism for the operation of Farm Cooling Tank Loan Scheme has been proposed and guidelines are being developed for applicants. They will include standards for quality and hygiene for installation of the tanks and also details on the testing of the milk being received for composition and quality.

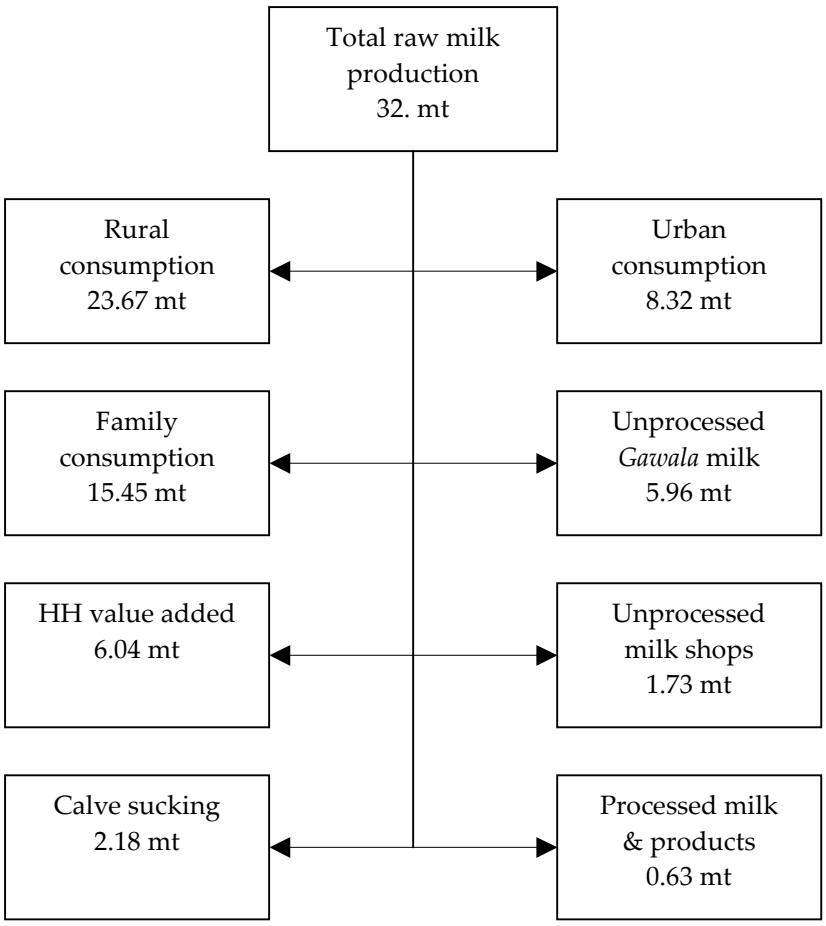
b) Model Farms:

The targets for this project are to establish fifty farms by the end of June 2006 and one hundred by the end of 2006. An Australian consultant is currently visiting Pakistan for this purpose. The first fourteen farms in Okara, Punjab have been formally established as model farms. These farms are generally of medium size and all supply Nestle. One model farm has been established in Sindh. Efforts have been made to identify clusters of farms to be established as model farms at stage two. It is proposed to work with one group of small farmers who are currently part of Idara e-Kissan / Halla and a further group of farmers in Sindh who currently supply Engro. In stage three, it is proposed to identify further farms with probable extension of the programme to NWFP.

c) Other Policy Interventions:

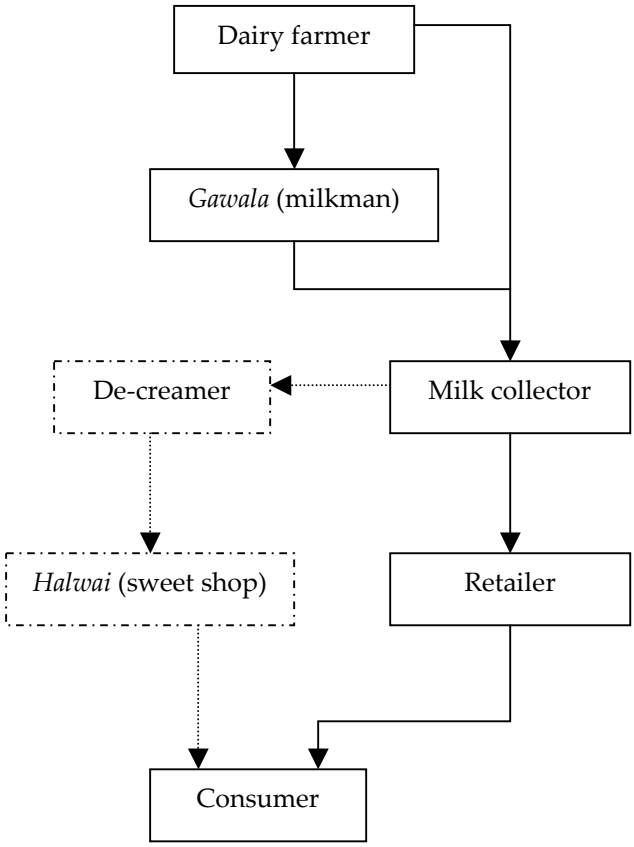
Draft Quality Standards are being worked on by a SWOG group who has provided the first draft paper for discussion with stakeholders. It is necessary to open a dialogue with PSQCA, PSI and other interested parties to progress in the establishment of food safety standards. Work is also being undertaken to establish a case for zero rating dairy products for sales tax.

Appendix 2: Milk distribution by quantity



Source: a. Milk production from FAO statistics 2002
b. Milk distribution based on SMEDA Report 2000

Appendix 3: Milk Supply Chain



Source: SMEDA Report 2000

Regoverning Markets

Regoverning Markets is a multi-partner collaborative research programme analysing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle- and low-income countries. The aim of the programme is to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of the dynamic changes in local and regional markets. The programme is funded by the UK Department for International Development (DFID), the International Development Research Centre (IDRC), ICCO, Cordaid, the Canadian International Development Agency (CIDA), and the US Agency for International Development (USAID).

Innovative Practice

Innovative Practice is a series of case studies from the Regoverning Markets programme providing examples of specific innovation in connecting small-scale producers with dynamic markets at local or regional level. Based on significant fieldwork activities, the studies focus on four drivers of innovation: public policy principles, private business models, collective action strategies by small-scale farmers, and intervention strategies and methods of development agencies. The studies highlight policy lessons and suggest working methods to guide public and private actors.

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