

Dairy

2.1. Production

World milk production is estimated at 613 million tonnes growing at a CAGR of 1.1%. India ranks first in the world in terms of milk production. Indian production stands at 91 million tonnes growing at a CAGR of 1.1%. Hence, India contributes 4 million tonnes to the world's incremental production of 7.5 million tonnes. With a higher growth rate, the per capita availability of milk in India (229 grams per day) is lower than the world average (285 grams per day). Buffalo milk is now estimated to account for 57% of the total milk production in India.

India has a unique pattern of production, processing and marketing/ consumption of milk, which is not comparable with any large milk producing country. Approximately 70 million rural households (primarily, small and marginal farmers and landless labourers) in the country are engaged in milk production. Over 100 million farmers are organized into about 0.1 million village Dairy Cooperative Societies (DCS) (about 1000 farmers per DCS). The cumulative milk handled by DCS across the country is about 18 million kg of milk per day. These cooperatives form part of a national milk grid which links the milk producers throughout the country with consumers in more than 700 towns and cities bridging the gaps on account of seasonal and regional variations in the availability of milk. The Anand Model which involves setting up institutional infrastructure at the village, district and state level (owned and operated by the farmers themselves) has progressively eliminated middlemen, enabling direct interface of producers with processors.

2.1.1 Key issues - production

The key issues in production include low productivity of milch animals and lack of quality control and monitoring mechanisms across the supply chain.

(1) Low productivity of milch animals

One of the key issues in production, is the low productivity of milch animals. India has the largest population of cattle (186 mn) and buffaloes (97 mn) in the world. While the average productivity of Indian cows is the lowest in the world, the productivity of Indian buffaloes is among the highest in the world.

Exhibit 2.1.1.A: Average yield of cows in India	
Country	Average Yield (Kg per year)
India	800
World Average	3100
Australia	4800
EU	5700
USA	8400

Source: FAO

³Year 2004, Source: FAO

⁴Year 2003-04, Dept. of Animal Husbandry & Dairying, Ministry of Agriculture

⁵Year 2004, Source: FAO

The solutions for improving productivity include the following:

A

- Enhancing production potential
- Improve production potential of indigenous breeds of cattle such as Sahiwal, Gir, Rathi and Kankrej and breeds of buffalo such as Murrah, Mehsana and Jaffarbadi, through appropriate selection programmes
- Cross non-descript cattle with Holstein Friesian in areas with adequate feed and fodder and with Jersey in resource-poor areas
- Increase production and use of high quality feed appropriate to local conditions
- Increase production and availability of green and ensiled fodder

B

- Superior animal care facilities and processes
- Expand first-aid coverage through village level societies, NGOs etc.
- Increase vaccination of animals against HS (Haemorrhagic septicaemia) , BQ (Black quarter) and FMD (Foot &-mouth disease)
- Develop National Animal Production and Health Information Systems, and Disease Free Zones in the country (As part of the Tenth Five Year Plan, the Indian Government is in the process of setting up the FMD-free zones in five major states in which export-oriented meat processing facilities are located)

(2) Lack of quality control and monitoring mechanism

There is a strong correlation between the quality of raw milk and the quality of the processed product. The bacteriological quality of raw milk in India at the time of milking is comparable with that in leading milk exporting countries (including EU, Australia and New Zealand). However, there is significant deterioration in milk quality from farm to factory. The deterioration takes place on two accounts:

- infrastructure issues (lack of all-weather roads, electrical supply for chilling centres, potable water supply, sewage disposal)
- Contamination through equipment, loss of time and lack of temperature-controlled storage/transportation.

Exhibit 2.1.1.B: Milk transportation & storage from farm to manufacturing unit				
	Farmer	Collection Centre	Chilling Centre	Dairy
Equipments	Utensils / Vessels	Handling equipment	Containers	Cans
Time (duration to transport from farmer to destination, in hours)	0	2-3	3-5	6-9
Temperature	Ambient	Ambient	4-5 degree centigrade	4-5 degree centigrade

Source: Industry, Interviews with producers, collection agents, Rabobank analysis

The time lag coupled with transportation at ambient temperature results in deterioration of quality in terms of Sensory Properties (odor, taste, colour), composition (Fat, SNF, Protein etc.), hygiene (bacteriological - pathogenic, somatic cells) and also leads to adulteration (water, foreign substances). The impact of the time lag and temperature during storage/transportation, on bacterial count in milk is depicted below:

Exhibit 2.1.1.C: Bacteria count at various temperatures and time intervals				
<i>Figures in Standard plate count per ml (in 1000)</i>				
Temperature	Fresh	24 hrs	48hrs	72hrs
4.4 °C	4	4	5	8
10 °C	4	15	125	6,000
15 °C	4	1600	33,000	326,000

Source: Industry Estimates

The above exhibit highlights that an incremental increase in temperature prior to pasteurization can lead to an exponential increase in bacteria count (EU standards allow a maximum of 100,000/ ml). Hence, transportation and storage in controlled temperature conditions is critical to preserve the quality of milk. However, cooling does not replace the need for hygienic milking conditions. An example of the impact of milking conditions on quality is described in the following exhibit.

Exhibit 2.1.1.D: Bacteria count in different milking conditions				
<i>Figures in Standard plate count per ml (in 1000)</i>				
Temperature	Fresh	24 hrs	48hrs	72hrs
Clean cows, environment and utensils	4	4	5	8
Dirty cows, environment and utensils	136	281	538	749

Source: Industry Estimates

The solution to the above issue lies in identifying and addressing handling, storage and transportation practices from the producer to the dairy plant and onward to the consumer, and facilitating improvement in hygiene, sanitation, food safety and operating efficiency in dairy plants.

The action plan includes:

- Increasing awareness about the importance of good quality milk among farmers
- Training of farmers on hygiene habits at farm level and collection centres
- Incentivising farmers through higher remuneration for quality milk
- Setting up quality testing infrastructure at the collection centre. This involves testing of bacteria count,

⁶Source: NDDB

acidity, smell/taste, conductivity, somatic cell count etc.

Installation of bulk coolers for efficient, collection is critical in preserving and improving the quality of milk. Benefits of bulk cooling include:

- Longer collecting intervals (milk can be collected once a day instead of the current practice of collecting twice every day) which reduces cost of transportation
- Flexibility in milk delivery & pick-up time
- Handling of cans is eliminated
- Increased potential for collection from producers in remote locations
- Maintenance of good hygienic conditions

The Government should incentivise dairies to invest in clean milk production and bulk cooling. The incentive can be in the form of reimbursing a part the cost of equipment for collection and testing.

- The government can develop a quality mark for milk on the lines of Agmark, which should include every important trait of milk quality, including:
 - hygiene quality: bacteriological and cytological traits, absence of pathogens and other contaminants
 - sensoric quality
 - nutritional quality
 - technological quality (processing ability)

This quality mark can be used by processors to differentiate their products vis a vis competition in the local and export markets A case study of the Komul (Kolar District Cooperative Milk Producers' Federation) Dairy in Karnataka on the benefits of investments made in clean milk production, bulk cooling and training is as follows:

Exhibit 2.1.1.E: Case study - Komul dairy development project

Investment Made in procurement infrastructure

- Bucket Milking machines
- Feed racks, water bowls and partitions
- Supply of Automatic milk collection units
- Supply of Bulk Milk Coolers
- 10 sets of 1000 LPD
- 10 sets of 2000 LPD
- Supply of Hygiene Kits
- Training - Union and DCS staff

Outcomes (within six months of investment)

- Milk producers received premium of INR 0.10/Lit. of milk as compared to earlier
- Milk yield increased by 10% at Community Milking Parlours
- MBRT values improved from 0.45-2 hrs. to 5.45-6.30 hrs
- Bacterial count declined from 1.5-7 mn to 0.15-0.4 mn cfu/ml
- Loss due to spillage reduced at DCS
- Lowering of transportation costs - once a day trip of tanker
- Improved capacity utilization of milk and dahi manufacturing units -Higher returns to the union

2.2. Processing of milk

2.2.1 Level of milk processing

About 35% of milk produced in India is processed. The organised sector (large scale dairy plants) processes about 13 million tonnes annually, while the unorganized sector (halwais and vends) processes about 22 million tonnes per annum. In the organized sector, there are 676 dairy plants in the Cooperative, Private Government sectors, registered with the Government of India and the state Governments.

Exhibit 2.2.1.A: Processing of Milk in India in organized and unorganized sector			
Degree of Processing	Type	Volume (million tonnes)	Share (%)
Unprocessed	Retention by rural consumers / sale to rural non-producers	39	45
	Sold as loose milk in urban areas	17	19
Processed (organized)	Packed liquid milk 8	8	
	Value added milk products	5	5
Processed (unorganized)	Value added milk products	22	23
Total		91	100

Source: Technology of Indian Milk Products* handbook. Publisher: Dairy India Yearbook; Rabobank Analysis

The market size of processed products in the organized and unorganized sector (at 2003-04 prices) is estimated at INR 255 bn and INR 906 bn respectively.

Exhibit 2.2.1.B: Share of organised and traditional (unorganized) market (INR billion) in year		
	Organised	Unorganised
Packaged liquid milk	98	-
Ethnic sweets	62.5	455 (Khoa based-375, chhanna based -80)
Curd and curd products		160
Cheese ²	21 (Paneer)	
Ice creams	8	-
Butter 5.2	60	
Ghee 35	210	
Milk Powder	38	-
Total	255	906

Source: CII A Report on Emerging Opportunities beyond Liquid Milk, Rabobank

There is huge potential for processing and value addition, particularly in ethnic Indian products, which are largely sold in unbranded form in the market. The key differences between the organized and the unorganized sector, is with respect to investments in preserving the quality of milk, technology used for processing and compliance with food standards. The solution lies in promoting investment in quality control and developing scalable efficient technologies for the unorganized sector.

2.2.2 Milk processing capacity

Milk processing capacity has grown at a CAGR of 4% over the last 6 years. Most of the new capacity is set up by the private sector as tabulated below. In the cooperative sector, few entities control bulk of capacity (23% of the cooperative capacity in Gujarat, 25% each in Tamil Nadu, Karnataka and Andhra Pradesh and 10% with Maharashtra). Players in the private sector have limited scale in production, as compared to these cooperatives.

Exhibit 2.2.2.A. Milk processing capacity (million litres per day)								
Year	Cooperative		Private		Other		Total	
	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
1996	194	24.2	250	24.4	65	7.3	509	55.9
Share		49%		40%		12%		
2002	212	28.4		44%		17%		
Share		39%		44%		17%		

Source: Department of Animal Husbandry, Ministry of Agriculture

2.2.3 Key issues in milk processing

Key issues in processing include lack of availability of milk in the lean season, limited diversity in product regional demand supply imbalances, lack of scale and lack of commercialization in ethnic products.

A. Lack of availability of milk in the lean season & limited flexibility in altering product-mix

Despite potential for processing, the capacity utilization of dairy plants is about 60% (assuming 300 working days in a year). The reasons for low capacity utilization are the lack of availability of milk, particularly in lean season and lack of diversity in the product mix of companies. Robust growth in consumption of milk and milk products (discussed in the next section) has resulted in the entry of private sector players. Since procurement of milk is concentrated in certain milk-surplus clusters, it has contributed to increase in milk procurement prices as below:

Exhibit 2.2.3.A: Milk procurement prices in INR per Kg in western UP				
Year	Cow			
	Flush Season	Lean Season	Flush Season	Lean Season
1998	6.4	10	9.4	13
1999	7	11	11.3	13.5
2000	7.5	11.75	11.5	13.75
2001	8	12	11.6	13.8
2002	7.5	11.75	11.7	13.8
2003	8.5	12.5	12.3	14.5

Source: Industry Estimates

B. Regional demand-supply imbalances

Further, there are regional imbalances in production, capacity growth and consumption. For e.g. Rajasthan has 8% share in production and 11% share in consumption of milk products, however the share in processing capacity is 4%. This implies that farmers in the state are losing out on the potential for value addition. A similar situation prevails in Bihar.

Exhibit 2.2.3.B: Growth per annum in production, processing and consumption of milk and						
States	Production Share	Production Growth (1991-92 to 2001-02)	Capacity Share	Processing Capacity Growth (1996-2002)	Consumption Share	Consumption Growth (1996-2002)
Andhra Pradesh	6%	6%	6%	1%	5%	6%
Bihar	5%	3%	1%	4%	7%	11%
Gujarat	7%	4%	9%	1%	9%	9%
Haryana	6%	4%	7%	2%	6%	5%
Karnataka	6%	8%	5%	5%	4%	8%
Kerala	3%	5%	1%	9%	3%	5%
Madhya Pradesh	7%	2%	3%	4%	7%	8%
Maharashtra	7%	4%	18%	4%	9%	7%
Punjab	10%	5%	7%	3%	6%	5%
Rajasthan	8%	4%	4%	7%	11%	5%
Tamil Nadu	5%	3%	7%	14%	4%	11%
Uttar Pradesh	19%	5%	18%	2%	19%	9%
West Bengal	5%	3%	2%	0%	4%	8%
Others	6%		12%		9%	
India		4%		4%		8%

Source: Department of Animal Husbandry, Ministry of Agriculture; NSSO

Bulk of new capacity in the period 1996-2002, has been established in the Northern states, Maharashtra and Tamil Nadu. Capacity expansion is expected to continue, driven by increased consumption of processed milk products. This will create competition for milk in key procurement belts of North India (Western UP, Punjab, Haryana), Rajasthan, Maharashtra, Tamil Nadu, Andhra Pradesh and North Karnataka. It is critical to match the increase in capacity with the increase in supply of milk supported by procurement infrastructure.

C. Lack of scale

The largest dairy player in India is Gujarat Cooperative Milk Marketing Federation Ltd. (GCMMF) with an annual turnover of approximately USD 0.5 bn (Financial Year 2002-03). The largest international dairy company is Nestle with annual turnover of USD 18 bn (Year 2003, turnover from the dairy business).

Exhibit 2.2.3.C: Annual turnover of India's leading dairy companies (INR bn)			
S. No.	Company	Dairy sales	Ownership
1	Gujarat (GCMMF)	22.4	Cooperative
2	Nestlé	8.4	Multinational
3	Mother Dairy	7.4	Cooperative
4	Hatsun Agro	3.1	Public
5	Dynamix	3.0	Private
6	Britannia	2.6	Private
7	Heritage	1.8	Public
8	Chitale Dairy	1.5	Private
9	Metro	1.2	Public
10	Creamline Dairy	1.15	Private

Source: Rabobank

The average milk processing capacity of India's leading dairy cooperatives is in the range of 0.1 to 0.35 million litres per day.

Exhibit 2.2.3.D: Scale of operations of India's leading dairy cooperatives				
State	Cooperative	Capacity (million litres per day)	Number of Dairy Plants	Average milk processing capacity per plant (million litres per day)
Andhra Pradesh	APDDCF	2.43	9	0.27
Haryana	HDDCF	0.53	5	0.11
Gujarat	GCMMF	6.59	19	0.35
Punjab	MILKFED	1.52	9	0.17
Rajasthan	RCDF	1	10	0.10
Tamil Nadu	TCMPF	2.6	15	0.17
Uttar Pradesh	PCDF	1.51	13	0.12

Source: NDDB

Lack of scale as mentioned earlier, is a significant reason for the inability to invest in procurement infrastructure, quality control, controlled temperature transportation on the one hand, and market development on the other.

D. Lack of commercialisation in Indian ethnic dairy products

India has huge potential in ethnic products, which has not been realized. Of the total milk produced in India, 46 % is used as liquid milk, 4 % for processing western dairy products and as much as 50% for processing traditional dairy products. The market sizes of various ethnic products is tabulated below:

Exhibit 2.2.3.E: Market size of ethnic products (INR bn)			
Type of products	Intermediate products	End Products	Estimated Market Size (Traditional + Organised)
Acid Heat Coagulated Products		Paneer	21
	Chhanna	Rasogolla, Sandesh, Pantua, Rasomalai, Cham, Channa Murki, Rajbhog, Chhana Podo etc	517
Heat desiccated products		Kulfi, Rabri, Basundi	
	Khoa	Burfi, peda, Gulabjamun, Kalakand, Khurchan, Dharwad peda, Kunda etc	
Fat rich products		Ghee, makhan, Malai	310
Cultured products		Dahi, Mishti Doi, Lassi, Chhach / Mattha	160
	Dahi, Chakka	Srikhand etc	

Source: CII - A Report on Emerging Opportunities beyond Liquid Milk

Gross margins on ethnic products, excluding cost of marketing and distribution, for the products listed above range from 12% to 38%:

Exhibit 2.2.3.F: Net margin potential in ethnic dairy products					
	Dahi	Lassi	Kheer	Rasogolla	Paneer
Ex-factory cost	100	100	100	100	100
Raw material	34	40	33	33	58
Packaging	25	7	4	17	3
Utilities	8	7	4	5	3
Manpower	6	6	4	5	10
Storage and distribution	5	4	3	3	3
Depreciation and interest	6	6	4	5	11
Net Margin	16	30	35	38	12

Source: Technology of Indian Milk Products* handbook. Publisher: Dairy India Yearbook; Rabobank Analysis

Despite the attractive inherent profitability, manufacturing and marketing of ethnic products has largely been the domain of unorganized sector (halwaiis), which offer short shelf life products. The large-scale commercialization is not possible due to lack of suitable, low-cost packaging solutions, which can enhance the shelf life of ethnic products. Thus the Government needs to give impetus to research in this area, to enable realization of the potential of this segment (also Refer Volume I: Chapter 8)

E. Taxation

In addition to the issues discussed above, various taxes increase the price of end products. These taxes include purchase tax on milk (e.g. 4% in Punjab), entry tax (e.g. 3% in Kerala), octroi and sales tax on milk and products (e.g. 4.5 to 7% octroi and 10.3 to 15.6 % sales tax in Maharashtra) etc. The state-level taxes on manufactured products create a non-level playing field with the unorganized sector, which can price its products lower as there is no outflow on account of such levies.

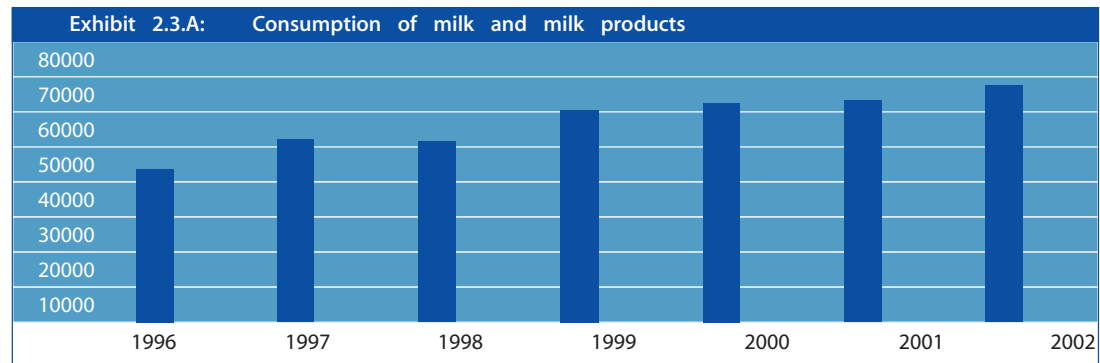
Further, there is high level of taxation on dairy equipment and machinery (16% central excise + 15.3% sales tax +4% octroi), with the exception of a few products which are exempt. Also, the excise duty on polyethylene film, aseptic packaging machines, milk vending machines, pouch filling machines, used in packing and distribution increases the cost of packed and pasteurized milk.

2.2.4 Cooperatives in the dairy sector

Cooperatives have played an important role in the development of the dairy sector in India. They are engaged in milk production, procurement, processing and marketing. However, as yet, cooperatives reach only 18% of India's villages, covering 17% of dairy farmers. Further, they face increasing competitive pressure from private sector players, not only in terms of marketing but also procurement of milk. As against these agile players, the functioning of cooperatives has been constrained on account of the prevalent legislative framework governing cooperatives in India, which stifles initiative and leads to inefficiencies. The cooperatives need to be provided greater autonomy and encouraged to pursue the legitimate interests of their members in an effective, self-reliant, responsible, accountable and democratic manner. The recently enacted Producer Companies legislation, which provides the same legal and regulatory framework enjoyed by companies, but protects the basic principles of cooperation- voluntary and unrestricted membership, democratic member control, participation of members in economic decisions, autonomy and independence, is a suitable alternative. Effective functioning of dairy cooperatives could translate into significant benefits to dairy farmers, on account of assurance of a market for end-use of their products.

2.3. Consumption of milk and milk products

Consumption of milk and milk-based products is growing at a faster rate, than the growth in production. estimated consumer demand for milk and milk products is INR 677 bn (at 1993-94 prices). Milk and milk products include liquid milk, condensed milk, baby food, ghee, butter, ice cream and other milk products. Demand for these products has grown at 7.6 % annually, from 1996 to 2002.



Source: NSSO Data and Rabobank Analysis

The consumption of milk and milk products in urban areas is about INR. 280 bn growing at 8.4 % annually. In rural areas, it is about INR 400 bn, growing at 7 %. The growth in market size is primarily driven by increase in per capita expenditure. This trend is evident as consumers are shifting towards value added products.

Exhibit 2.3.B: Growth in population and per capita expenditure on milk and milk products

Year	Population (billion)	Per capita expenditure (INR)
1996	0.93	467
1997	0.95	549
1998	0.97	532
1999	0.98	618
2000	1.00	628
2001	1.01	625
2002	1.03	659
CAGR	1.6%	5.9%

Source: NSSO data and Rabobank Analysis

2.4. India's share in global trade

Given the perishable nature of milk, only 7 % of world production is traded (excluding intra-EU trade). Dairy products traded in the world market include butter and milk fats, cheese, condensed milk, whey, casein and ingredients. Share of liquid milk is restricted to UHT milk in small quantities from Australia to South East Asia. The relative size of world trade in key dairy products is depicted in the following table.

Exhibit 2.4.A: Global trade in dairy products				
Product	Intra EU Trade	World Trade	World Production	Figures in mn MT
				World Trade as % of Production
Liquid milk, retail pack	1.7	< 0.5	> 100	< 0.5%
Cream, retail pack	0.1	0.1	~ 5	~2%
Yogurt, fermented milk	0.75	0.4-0.5	~ 15	~3%
Cheese	1.8	1.1-1.2	15	7-8%
Condensed milk, retail pack	0.2	0.5-0.6	4	10-15%
Butter	0.6	0.8-0.9	6.5	10-15%
Whole milk powder	0.25	~1.3	2.5	50%
Skim milk powder	0.5	~1	3.5	30%

Source: CFCE / IDF, Rabobank International

The key surplus and deficit regions, along with the major dairy products imported by the region, are depicted below.

Exhibit 2.4.B: Sufficiency level in milk		
Milk Sufficiency	Region	Sufficiency Level
Milk Surplus	Oceania (Australia + New Zealand)	300%
	Western Europe	110%
Milk Sufficient	South Asia	100%
	CIS	100%
Milk Deficit	South America	95%
	Central America	80%
	Africa	65%
	South East Asia	65%
	Middle East	55%

Source: Rabobank International

Both Oceania (Australia and New Zealand) and EU are surplus regions and dominate world exports with Asia, North America and Middle East being the key importers. The EU played a dominant role in world dairy trade but its share has been declining in recent years, on the back of reduction in subsidies. The shift in market shares in world dairy trade are listed below:

Exhibit 2.4.C - Global market shares in milk equivalents		
% of volume	1999	2002
EU-15	36	29
Rest of Europe	11	11
New Zealand	22	29
Australia	16	18
USA	6	4
Argentina	5	4
Rest of World	4	5

Source: Dutch Dairy Board, Rabobank, 2004

India's exports have an insignificant share in global dairy trade (< 1 %) despite India being the largest milk producer.

Exhibit 2.4.D: Exports of dairy products			
Figures in USD Million			
Year	World	India	India's Share in Global Trade
1998	26,752	4	0.02%
1999	25,417	11	0.04%
2000	25,333	23	0.09%
2001	26,742	42	0.16%
2002	25,922	26	0.10%
CAGR	-1%	58%	

Source: FAO

India has two distinct competitive advantages, which can be leveraged to enhance exports.

A. Low farm gate prices

Amongst the important milk producing countries; Argentina, New Zealand and Australia have slightly lower farm gate prices than India, but these account for only 10% of global milk production.

Exhibit 2.4.E: Competitiveness at farm gate		
Countries	Share in Production	Farm Gate Prices /100 Kg (US \$)
Ukraine / Belarus	3%	< 10
Zimbabwe	1%	11
Poland, Argentina, Latvia	4%	13-14
Australia, New Zealand, South Africa, Estonia	5%	16-17
India	15%	19-23
Czech Republic, Hungary	1%	19-23
EU, USA, Croatia	35%	38
Japan	1%	60

Source: ZMP / IDF, Rabobank International

B. Proximity to milk deficit markets

India has a locational advantage to serve milk deficit areas in neighboring countries. The markets and their import dependence is as follows:

Exhibit 2.4.F: Milk production and share of imported milk and milk products		
Countries	Milk Production (000' tonnes)	Share of imported milk (%)
Bangladesh	NA	40
Indonesia	498	40
Malaysia	39	95
Philippines	10	97
South Korea	NA	97
Sri Lanka	NA	65
Thailand	480	79

Source: "Dairy India". Publisher: Dairy India Yearbook, New Delhi.

In addition, demand for milk products in these markets is expected to be strong.

Exhibit 2.4.G: Growth forecast (2003-07)		
	South East Asia (%)	South Asia (%)
Liquid Milk	5	2
Fresh Products	10	10
Cheese	5	5
Butter	3	2
Skimmed Milk Powder	10	10
Whole Milk Powder	10	5

Source: Rabobank

However, India is not able to capitalize on these advantages due to the following reasons:

- low quality and hygiene standards
- lack of experience marketing products in international markets
- Significant growth in consumption of milk products in the domestic market leading to limited surplus for exports

The opportunity for India to participate in world trade is set to become very attractive. As per the new regulations, the US will have to grant increased market access for butter, cheese and skim milk powder, while export subsidies for butter will be reduced. Similarly, the EU will have to reduce its subsidized exports of cheese and meet production deficit through imports. New Zealand, Australia and Argentina are already capitalizing on the opportunities emerging from the increase in market access required by the WTO.

India needs to develop competitiveness in products which are being imported by markets such as China, Japan and Thailand. These products include skimmed milk powder and butter oil. In addition, a potential product is whey powder, which is used as a feed ingredient. Also the importance of value-added whey products for high-end food and non-food applications is growing.

To achieve these objectives, India needs to have a consistent exportable surplus and meet quality requirements of importing nations

2.5 Vision, strategy and action plan

The vision for the dairy sector entails

- Increase in level of processing to 30%
- Enhanced commercialization of ethnic Indian products
- Increase in India's share in global trade

Backed by

- Enhance sufficiency level in milk production

The strategy to achieve the stated vision is summarized below:

	Increase level of processing	Enhance commercialization of Indian ethnic milk products	Increase share in exports	Enhance sufficient level in milk
Increase productivity / ensure milk availability	☐			☐
Promote hygienic production of milk at farm level	☐		☐	☐
Preserve and improve quality of milk in the milk value chain	☐		☐	
Promote milk testing at village level	☐		☐	
R & D for developing machinery / processes for large scale manufacturing		☐		
Develop packaging solutions for enhancing shelf life, particularly for ethnic dairy products Focused market/product approach for increasing exports		☐	☐ ☐	

The short-term and long-term action plan for the Central and for the State governments is as follows:

Central Government	<ul style="list-style-type: none"> • Training of unorganized sector • Offer financing schemes through nodal agencies to promote bulk cooling and storage • Promotion of dairy exports in milk deficit markets • Catalyse R & D for commercialization of indigenous products • Zero excise duty on all milk products • Impetus on research and extension for livestock development and improving productivity of milch animals
State Government	<ul style="list-style-type: none"> • Develop milk testing infrastructure at village level • Nil indirect taxes on milk products (sales tax, octroi etc.) • Impetus on research and extension for livestock development and improving

1. Training of the unorganized sector

Training of the unorganized sector on food standards, testing, cost-efficient processes etc. is required to upgrade their level of operations. Small manufacturers of indigenous products, such as halwais, need to be trained to adopt hygienic practices for quality improvement. The state / district level bodies, cooperatives, ITIs can be involved in such efforts.

2. Impetus on research and extension for livestock development and improving productivity of milch animals

The Central Government, together with State Governments needs to develop time-bound programmes for improvement in productivity through the following measures:

- Expand coverage of artificial insemination
- Take up genetic improvement programmes in selected milksheds to supply semen of evaluated bulls to all milksheds
- Create first-aid facilities in DCSs
- Create Disease-free Zones
- Incentivise investment in production of cattle feed

3. R & D for commercialization of indigenous dairy products

Commercialization requires development of mechanized systems and continuous packaging machines. It requires collaborative efforts of the industry, the unorganized sector, machinery manufacturers and R & D institutions. In this context, an apex research institute (Refer Volume 1, Chapter 8) could play a key role in coordinating such research. Further, the Government could develop specific schemes to incentivise investments of such machinery through specific financing schemes for investment in such machinery.

4. Promoting dairy exports in milk deficit countries

India should focus primarily on markets in South East Asia, Middle East and Africa, which are milk deficit. Majority of countries in these regions import skimmed milk powder and butter oil, however there is competition from EU and Australia New Zealand in these commodities. Cost competitiveness along with aggressive promotions would be required to make a dent into these markets. The Ministry of Food Processing in conjunction with the NDDB, needs to undertake generic promotional campaigns to enhance the image of Indian dairy-based products in these markets.

5. Develop milk testing infrastructure at village level

Milk testing infrastructure needs to be upgraded from measuring only “fat content” to measuring fat, SNF content, bacterial count, heavy metals, pesticides residue somatic cell count etc. Quick tests need to be developed to assess presence of contaminants in milk at farm level. These parameters should be monitored and recorded to assist processors in grading and making payments to producers on the basis of overall milk quality. Government should standardize the quality control mechanism and make it mandatory for dairy companies to comply with these. Government should incentivise processors to invest in quality control infrastructure. The incentive can be in the form of tax rebate or subsidy.

6. Promote bulk cooling and storage

Companies need to be incentivised to install bulk coolers / chilling centres for procuring milk. The Government can announce specific financing schemes to part-fund these investments.

7. Zero indirect taxes on milk & milk products

This is an important measure required to enhance affordability of dairy products, as also incentivise processors to invest in market development.

The organized dairy segment has the potential to grow to INR 2756 bn, on the back of volume growth, addition together with an enhanced product mix.

Exhibit 2.5 A: Market potential and investment																	
	Current market Size / Growth					Market Size / Growth for 2012 and 2015					Capacity required			Investment required			
	Current Volume (Million Tonnes)	Average Price (INR /Ton)	Current value (INR Million)	Current Growth (%)	Value additional per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)	Current capacity (Tonnes/day) & Utilization(%)	New capacity required (2005-10) Tonnes/day	New capacity required (2010-15) Tonnes/day	Investment (2005-10) (INR Million)	Investment (2015-15) (INR Million)	Total investment (2005-15) (INR Million)
Production	91			4%		116		141		4%	4%						
Processed																	
Organised	11		254000	8%		29	1212000	42	2755974	15%	8%	73970	86866	40437	217165	101091	318257
Liquid Milk		8	12250	98000			16	224000	22	308000	13%	7%					
Milk Products		5	31200	15600			10%	13	988000	20	2447974	18%	9%				
Unorganised (milk products)	22	41182	906000	5%		28	1274833	36	1627046	5%	5%						
Total processed	33		1160000			57	2486833	78	4383020								
Share pf Processed (%)	35%																
Organised	13%					25%		30%				50%	60%	70%			
Unorganised	22%																

Capacity utilization is expected to increase to 60% in 2010 and 70% in 2015. Additional capacity creation require investment of INR 217 bn until 2010 and INR 101 bn in the period 2010-15.