

CHAPTER-IV

DAIRY PROCESSING INDUSTRY IN INDIA

Agriculture along with animal husbandry has been and will continue to be the lifeline of Indian economy. India is the largest and one of the most economical milk producers in the world (estimated production of 105 million tons). It is the most important sector of the Indian economy particularly in poverty alleviation and employment generation. This sector contributes close to one-fourth of India's National income and total work force engaged in agriculture is about 60 per cent.

In India, the dairy sector plays an important role in the country's socio-economic development, and constitutes an important segment of the rural economy. Dairy industry provides livelihood to millions of homes in villages, ensuring supply of quality milk and milk products to people in both urban and rural areas. With a view to keeping pace with the country's increasing demand for milk and milk products, the industry has been growing rapidly.

India in the early 1950s was importing around 55000 tons of milk powder annually to meet the urban milk demand. Most of the significant developments in Dairy Industry have taken place in this century only now. According to research report, Indian Dairy Industry Analysis, India is the world's largest milk producer, accounting for around 17% of the global milk production. Besides, it is one of the largest producers as well as consumers of dairy products. Due to their rich nutritional qualities, the consumption of dairy products has been growing exponentially in the country, and considering such facts and figures, our study anticipates that the milk production in India will grow at a CAGR of around 4% during 2011-

2015. With the rising use of dairy products, the secondary market for dairy products has also been flourishing.

The Indian Dairy Development is quite different from those of the developed countries. As India enters an era of economic reforms, agriculture, particularly the livestock sector is positioned to be a major growth area. The fact that dairying could play a more constructive role in promoting rural welfare and reducing poverty is increasingly being recognized. All these above aspects are the stepping-stones to reach white revolution.

Many efforts have been made in this regard and have been proved to be fruit full. Among these are the Operation Flood program which was launched in 1970-71, and dairy development through producers Cooperatives and milk production based on milk shed was promoted in rural areas.

Cooperative Movement in Dairying⁹⁴

Immediately after India gained independence in 1947, the Milk Control Board was established to control the dairy supply and distribution chains. However, a number of issues emerged. First, the middlemen got hold of the sales profit and the share of producers in the sales declined. Second, as processing units were set up in cities, it became difficult for the milk to be procured and transported the production centres in the rural areas. Consequently, the yield of milk declined and imports of milk powder went up.

Dairying in India was largely unorganized before the Independence. Crop farming and dairy farming are the part of food production for human population in India. But in recent years dairying has emerged as an important instrument for providing employment and additional income to rural house holdings. The organized dairying has been started in a small way when military dairy forms and creameries were established towards the end of 19th

⁹⁴ Goswami, B. (2007, October 4-5). *Can Indian Dairy Cooperatives Survive in the New Economic Order?* Paper presented at the WTO Public Forum "How Can the WTO Help Harness Globalization", Geneva, Switzerland.

century to meet the demand of the armed forces and their hospitals, Some private dairies such as co-venture and polsoms with more or less processing facilities were encouraged to make pasteurized butter. In the past dairy farming was basically carried out and managed at the house hold level. Milk and its products were produced mainly for home consumptions and to some extent, for the local market. Rapid growth of urban population change in food habits, technological advancement in transportation. Processing and refrigeration have, however brought out significant changes in the pattern of production and marketing of milk.

Co-operatives have generally been found to be the successful form of organization for production, procurement, processing and marketing of milk in the world. The first co-operative dairy society in India was established at Allahabad (UP) in 1913. The Calcutta Milk supply societies union established in 1919 was the earliest co-operative organization in the country for the supply of clean pasteurized milk to consumers. The establishment of milk co-operatives has been the most important feature of the dairy industry in India, during the post-independence period. During the pre-independence period in addition to co-operative dairy societies and unions, some dairy farms were established by private institution, and Indian Agricultural Research Institute. The earlier milk co-operative mostly collected and sold raw milk to local consumers. But the first large-scale and systematic breakthrough in dairy co-operatives in India was made in 1948 by the Kaira District Co-operatives Milk producers Union Limited at Anand in 1946. The basic concept at Anand was different from the previous co-operatives. In that its processed fluid milk for sale at a distant market like Bombay. This unit also produced milk products for markets located all over the country and provided technical inputs for milk production enhancement. The Kaira Union emerged as a pioneer in the milk co-operative movement in India. Encouraged by the success of the union, milk producers in other districts of Gujarat and some parts of the country also formed milk co-operatives on the same pattern. Subsequently, the Kaira Cooperative Union established a marketing agency named Gujarat Cooperative Milk Marketing Federation, which follows a

three-layer structure that collects, processes and markets dairy products at village, district and state levels. The district units also provide technical support to the milk producers and a range of services such as feed, veterinary care, artificial insemination, education and training. These milk cooperatives of Gujarat today own the GCMMF, the largest food products business in India. GCMMF is also the largest exporter of dairy products from India and owns the brand Amul, which in a vernacular language means “Highly Valuable or Priceless”.

ANAND PATTERN:

The system of production, procurement, processing and marketing of milk adopted by the Kaira Union is popularly known as Anand pattern or the Amul pattern. Anand is the place of headquarters of the Kaira Union and Amul is the brand name of dairy products produced by the Kaira union. Anand pattern was regarded as a model for dairy development in rural areas in and outside the country. This system was approved by the Rural Credit Review Committee ⁹⁵as well as by the National Commission on agricultural for implementation throughout the country. Under the Anand Pattern, a primary co-operative society of milk producers is formed at the village level. These societies are federated in a milk union at the district level. Milk unions are further federated at the state level in a Federation. There has been a many- fold increase in the number, membership and turnover of milk co-operatives in the country, during the post-independence period. In pursuance of a government directive (1964) to set up milk co-operatives on Anand Pattern throughout the country, the National Dairy Development Board (NDDB) was set up at Anand in 1965. The NDDB drew up a program known as “Operation flood” to replicate the Anand pattern in 18 areas of milk production in the milk sheds of Bombay, Delhi, Calcutta and Madras. The world’s largest dairy development program the “Operation Flood” undertook the gigantic task of upgrading and modernizing milk production, procurement and marketing with the assistance provided by the world Food Program, European Economic Community (EEC), the World Bank and

⁹⁵ (Venkatappaiah Committee 1969)

other international agencies. The Indian Dairy Corporation (IDC) was specially set up in 1970 by the Government of India for receiving the gift of the skim milk powder and butter oil under the World Food Program and generating funds by their sale for the implementation of the project.

Operation Flood Era ⁹⁶

India's dairy sector witnessed a spectacular growth between 1971 and 1996; the period was known as the Operation Flood era. An integrated cooperative program aimed at developing the dairy industry was implemented in three phases, with The National Dairy Development Board designated by the Government of India as the implementing agency. The major objective was to provide an assured market round the year to the rural milk producers and to establish linkage between rural milk production and urban market through modern technology and professional management. Further it was meant to achieve vertical integration of milk procurement, processing and marketing through a three-tier co-operative structure. The Operation Flood was one of the world's largest rural development programs which ran for 26 years and eventually helped India to emerge as the world's largest milk producer. As part of the program, around ten million farmers were enrolled as members of about 73000 milk cooperative societies.

The first phase of the program termed Operation Flood-I (OF-I) lasted from 1970-71 to 1977-78. Second stage of Operation Flood-II (OF-II) lasted from 1978-79 to 1984-85. There was a transition period of two years, 1985-86 and 1986-87 before the Operation Flood-III (OF-III) began in 1987-88 and ended in April 1996.

The Operation Flood I ended on 31st March 1981 with an investment of Rs. 1,160 million, benefiting 1.5million rural families banded together in 12000 village co-operatives milk producers' societies in 27 selected milk shed districts. It paved the way for the

⁹⁶ Tikku, D. (2003, November). *Indian Dairy Sector and the National Dairy Development Board: An Overview*. Address made at the International Workshop of Livestock and Livelihoods: Challenges and Opportunities for Asia in the Emerging Market Environment, Anand, India.

expanded program Operation Flood II. The Project Operation Flood II drawn in 1979, is to cover 26 states and union territories with an additional investment of Rs.7,800 million, the program envisages to cover 155 milk shed districts and linking them to markets in 147 towns and cities, benefiting 10 million rural families. The funds for the program are being partly generating by the sale of 186 thousand tones of milk power and 76 thousand tones of butter oil donated by the European Economic Community (EEC). The purpose of these dairy development projects is to implement integrated program for increasing the production of milk in rural areas through co-operative development program following the Anand Pattern, which also includes import of cattle, quality cross breeding, animal health improvement, the development of facilities for milk collection processing and marketing and provision of training for farmers and instructors. The union Government has also set up a Dairy Development Department to co-ordinate the activities of NDDB, IDC and the State Governments, National Co-operative Dairy Federation was also formed in 1972 with headquarters in Delhi. The Federation undertakes organizational and promotional programs in the connection. Thus, a large organizational set-up has been created to work for dairy development in India.

The Operation Flood program was a major policy development, which provided the missing market link between the urban milk consumers and rural producers through a network of Co-operatives. The decision to promote dairy development through Co-operative was based on a number of considerations. The important among them was dairying, which would provide an additional source of employment. The next one is the formulation of Government policies to support dairy Cooperatives. Large scale public investments made in processing and marketing infrastructure through Co-operatives was another major consideration. To promote domestic production under Cooperatives, it was protected from cheap subsidized imports of dairy products (butter, butter oil, ghee, cheese, and milk powder) through various import substitutes and restrictions/imposition measures. The Indian dairy

Cooperatives were the canalizing agency for the import of milk and milk products. These products were available in the international markets at prices, which made processing of milk and milk products cheaper than collecting and selling of dairy products. However, all these things happened in the closed economy environment. Now the entire scenario has changed and the protection to this sector has come by imposing quantitative barriers such as canalizing of imports and exports of the dairy products and also by adopting import substitution policy, which leads to protection of domestic dairy sector from imports. The competition from organized private sectors was controlled by utilizing the provision of industrial licensing under Industrial Development and Regulation Act 1951 to prohibit new entrants into milk processing sector. In the early nineties, the Government of India introduced major trade policy, which favored liberalization of all sectors of economy and dairy sectors was no exception to this. The dairy industry was de-licensed in 1991 with a view to encourage private investment and flow capital and new technology in the sector. The competition from the organized private sector was immediate in the form of sharp increase in capacities for milk processing, especially in areas where milk availability was relatively significant. Within a year of de-licensing over 100 new dairy processing plants come up in the private sector. However, in 1992 the Milk and Milk Products Order (MMPO) was promulgated under the essential commodities Act 1955 to regulate milk and milk products production in the country. There was certain inherent weakness in the MMPO for example; every unit was required to develop its milk-shed areas to procure milk for processing. In some cases the milk sheds areas were quite far away from the processing units, which increased the cost of transportation and also affected quality of raw milk because of many units did not have required infrastructure (Cold chain) to procure and to transport of milk. Since many of the existing milk shed, the procurement by organized sector was low; it was surprising to restrict the entry of other players in those areas. It's recognizing the need for suitable amendments in the MMPO Act 1992, GOI has made amendment's from time to time

in order to make more liberal and facilitated the dairy development. During 2001 the Government made some important amendments in MMPO Act 1992, whereby the registration of units handling up to one lakh liters of milk per day or 5000 tones of milk solids per annum was granted by the concerned state Government. And the requirement of renewal license was abolished, but the Government controls, regulations, and licensing requirements restricted large Indian and multinational players for making significant investments in this sector. In the month of March 2003, GOI abolished the restrictions on setting up milk processing and milk products manufacturing plants and removed the concept of milk shed, whereas requirements regarding to food safety and hygiene were retained in the MMPO.

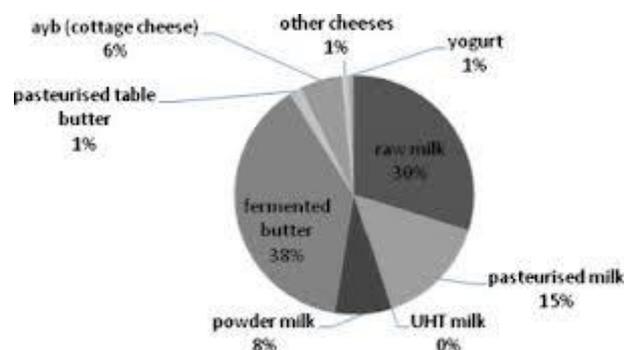
The Cooperatives should be managed and run on commercial lines and corporatization of cooperative will enable to compete effectively in open market environment by amendments of Multi State Cooperative Society Act 1984. Similarly amendments in the state act on the lines of the model co-operative law. The WTO regime is now a reality as India is a signatory under the WTO rules has opportunity to extend its exports product base. It's become more open world trade regime where barriers to trade were reduced. The major dairy products exported from the country includes skimmed milk powder, whole milk powder, ghee, butter oil, milk food for babies, butter, milk for babies, milk and cream etc. The positive trend in export and negative trend in imports was observed due to the success full implementation of Operation Flood and set of Government policies regarding international trade.

At global level, milk has been identified as an integral part of food for centuries. The success of White Revolution in India has largely been written by millions of small holders. About 70 million dairy farmers produce more than 50 per cent of the milk in the country. Milk and milk products are one of the important components of the Indian food industry.

Consumption of milk and milk products is deeply rooted in our tradition and it is an essential item during rituals, festivals and other auspicious events.

Dairy market in India is quite huge and according to an estimate the unorganized milk and milk product market is about Rs 470 billion while the market for processed organized dairy segment is only Rs 10000 crores. The market is currently growing at round 5% pa in volume terms. There is an impressive level of processing i.e. 22% in organized sector. The dairy exports in 2007–08 rose to US\$ 210.5 million against US\$ 113.57 last fiscal, whereas the domestic dairy sector is slated to cross US\$ 108 billion in revenues by 2011. India with its population of more than 1 billion and diverse food habits, cultures, tradition and religions, offer great market for milk and milk products. Milk products with well defined quality characteristics and packaged in attractive containers can be marketed at different places. Most dairy food delicacies are value added products generating high profits.

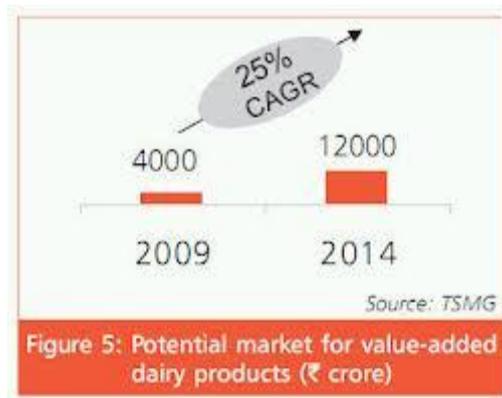
CHART III.1 DEPICTING PERCENTAGE SHARE OF DIFFERENT MILK PROCESSED PRODUCTS IN A MODEL DAIRY PROCESSING INDUSTRY



The milk products produced include curd, ghee, khoa, chhana, paneer, shrikhand , milk powder, whitener ,condensed milk, malted milk food, ice cream and a variety of milk sweets, some of which are now produce d by the organized dairy industries as well, are major value added products from the Indian dairy sector.

The market for traditional dairy products in India is estimated to be US \$ 10 billion, being the largest and fastest growing segment of the Indian dairy industry.

CHART III.2 DEPICTING POTENTIAL FOR VALUE-ADDED DAIRY PRODUCTS



Driven by steady population growth and rising income, milk consumption continues to rise in India. Dairy market is currently growing at an annual growth rate of around 7 per cent in volume terms. The market size of Indian dairy industry stands at around US\$ 45 billion. India is well known as ‘Oyster of global Dairy Industry with opportunities galore for entrepreneurs on the globe. It might be dream for any nation in world to capitalize on large and fast growing milk and milk products marketing. Main objective of Indian Dairy Industry is to manage national resources in a manner to enhance milk production and up-gradation of milk processing using innovative technologies. Indian dairy Industry achieved the status of producer-owned and profit manufacturing co-operative system. More than 10 million dairy farmers belonging to 96,000 dairy co-operatives who sell produce to one of 170 milk primary co-operative unions who in turn are supported by 15 state co-operative milk marketing federations are all the constituents of Indian Dairy Industry.

Since India’s population is predominantly vegetarian; milk serves as an important part of daily diet. Indians use milk in various preparations such as in brewing tea and coffee, in

making yogurt or curd and in preparing many Indian dishes. For most households, milk is also a popular beverage due to its nutritional value.

As income from crop production is seasonal, instead dairying provides stable income which is year round and also important economic incentive for several farmers every rural household in India concentrates on dairying. In India, rural households consume almost 50 percent of total milk production. The remaining 50 percent is sold in the domestic market. Of the share of milk sold in the domestic market, almost 50 percent is consumed in fluid form, 35 percent is consumed as traditional products (cheese, yoghurt and milk based sweets), and 15 percent is consumed for the production of butter, ghee, milk powder and other processed dairy products (including baby foods, ice cream, whey powder, casein, and milk albumin). Favourable price environment for milk production in Dairy Industry in India weakened in 90's. Decline in real profits in milk noticed after 1992 and then regained glory after 1992 till now.

The Indian dairy sector is also different from other dairy producing countries as India places its emphasis on both cattle and buffalo milk. In 2010, the government and the National Dairy Development Board have drawn up a National Dairy Plan (NDP) that proposes to nearly double India's milk production by 2020. This plan will endeavour to increase the country's milk productivity, improve access to quality feeds and improve farmer access to the organized market. These goals will be achieved through activities that focus on increasing cooperative membership and growing the network of milk collection facilities throughout India.

Most dairy products are consumed in the fresh form and only a small quantity is processed for value addition. In recent years, however, the market for branded processed food products has expanded. Although only around 2 per cent food is processed in India, still the highest processing happens in the dairy sector, where 35 per cent of the total produce is processed, of which only 13 per cent is processed by the organized sector.

India is one of the most attractive destinations for business & investment opportunities, having 16% of the world's human population i.e. 1.22 billion being the 4th largest economy of the world with growing GDP @ 8% and per capita income @ 17.3% (i.e. Rs 54,527 in 2010-11)

Indian Dairy Key Facts

- Ranks 1st in world milk production (115 million metric tones)
 - Value of milk output from livestock (at current price) is around INR 2400 Billion
 - Value of dairy products market is around INR 4000 Billion
 - Ice cream industry is around INR 25 Billion
 - Milk production in India has come a long way over the years from a low volume of 17 MT in 1951 to around 115 MT in 2010; 70% of milk is produced by marginal farmers.
 - 65 per cent of the milk is sold in “loose” form
 - Only 5 per cent of the milk is sold through retail chains
 - 70 per cent is delivered to the homes by ‘milk agents’
 - Carton milk or packaged milk has been growing at 24 per cent annually
 - Most branded FMCG companies are keen on launching flavoured dairy products whose market size is pegged at US\$ 166 million.
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Despite India being the largest milk producing nation in the world the Indian Dairy Industry is weighed down by a host of problems like low milk productivity of milch animal i.e. 987kg/year (world average is 2200kg/year) , large no. of unproductive animals, low genetic potency, poor nutrition etc.

TABLE III.1 SHOWING KEY STATISTICS OF INDIA'S DAIRY INDUSTRY

Key Statistics: Annual Milk Production (2008-9)⁵	108.5 Million Tons
Annual Export Volume (2008-9)⁶	70,790 Tons
Share of world dairy production (2010)⁷	15%
Share of world trade in dairy products (2003)⁸	0.3%
Milking herd size ⁹	115.5 million
Number of milk producers' cooperative unions	170
Number of local dairy cooperatives	96,000
Number of state cooperatives ¹⁰	15
Per capita consumption (Drinking milk) ¹¹	250g/day
Estimated percentage of dairy farmers in organised sector ¹²	40-50%
% of dairy produce consumed by unorganised sector ¹³	65%
Dairy industry workforce ¹⁴	75 million women/ 15 million men

⁵ National Dairy Development Board (2010). *National Statistics*. Retrieved 16 Jun 2011, from <http://www.nddb.org/statistics/milkproduction.html>

⁶ Technopak. (2010). *Public Private Partnership in Indian Dairy Industry 2010*. Retrieved 17 June 2011, from

http://www.technopak.com/resources/Food/PPP%20in%20Indian%20Dairy%20Industry_Technopak_CII_Background%20Paper_May08,2010%20pdf%20ver.pdf

⁷ Chand, S., Saraiya, A., & Sridhar, V. (2010). *Public Private Partnership in Indian Dairy Industry*. Retrieved 17 June 2011, from

http://www.technopak.com/resources/Food/PPP%20in%20Indian%20Dairy%20Industry_Technopak_CII_Background%20Paper_May08,2010%20pdf%20ver.pdf

⁸ Goswami, B. (2007, October 4-5). *Can Indian Dairy Cooperatives Survive in the New Economic Order?* Paper presented at the WTO Public Forum "How Can the WTO Help Harness Globalization", Geneva, Switzerland. Retrieved 16 June 2011, from

http://www.wto.org/english/forums_e/public_forum2007_e/session11_goswami_e.pdf

⁹ Chand, S., Saraiya, A., & Sridhar, V. (2010). *Public Private Partnership in Indian Dairy Industry*. Retrieved 17 June 2011, from

http://www.technopak.com/resources/Food/PPP%20in%20Indian%20Dairy%20Industry_Technopak_CII_Background%20Paper_May08,2010%20pdf%20ver.pdf

¹⁰ Indian Mirror. (2011). *Indian Dairy Industry*. Retrieved 17 June 2011, from

<http://www.indianmirror.com/indian-industries/dairy.html>

¹¹ Chawla, A., Chawla, N., & Pant, Y. (2009). *Milk and Dairy Products in India- Production, Consumption and Exports: Introduction*. India: Hindustan Studies & Services Ltd. Retrieved 17 June 2011,

<http://www.hindustanstudies.com/files/dairysept09tocintro.pdf>

¹² Singh, R. (2011). *India Dairy and Products Annual Report 2010*. USDA Foreign Agricultural Service: Global Agricultural Information Network. Retrieved 16 June 2011, from

static.globaltrade.net/files/pdf/20110226231255627.pdf

¹³ Singh, R. (2011). *India Dairy and Products Annual Report 2010*. USDA Foreign Agricultural Service: Global

Agricultural Information Network. Retrieved 16 June 2011, from static.globaltrade.net/files/pdf/20110226231255627.pdf

¹⁴ Goswami, B. (2007, October 4-5). *Can Indian Dairy Cooperatives Survive in the New Economic Order?* Paper presented at the WTO Public Forum "How Can the WTO Help Harness Globalization", Geneva, Switzerland

TABLE III.2
SHOWING PER CAPITAL AVAILABILITY OF MILK

Year	Grams per day
2000-01	220
2005-06	241
2008-09	250*

**estimated,*

Source: Department of Animal Husbandry and dairying

TABLE III.3
SHOWING DAIRY LIVESTOCK POPULATION IN INDIA BY SPECIES⁹⁷

Species	(In millions)
Cattle	185.2
Adult Female Cattle	64.5
Buffalo	97.9
Adult Female Buffalo	51
Total Bovines	283.1
Goat	124.4

⁹⁷National Dairy Development Board (2010). *National Statistics*. Retrieved 16 Jun 2011, from <http://www.nddb.org/statistics.html>

CHART III.3 DEPICTING SWOT ANALYSIS OF INDIAN DAIRY INDUSTRY

Strength	Weakness
<ul style="list-style-type: none"> ○ Largest milk producer in the world around 100 million MT. Indian dairy Industry value of output amounts to Rs.1179 billion in 2004-05 which approx equals combined output of paddy and wheat. ○ A huge base of around 11 million farmers ○ Traditional emphasis on consumption ○ 1/5th of world bovine population in India 	<ul style="list-style-type: none"> ○ Poor feeding practices ○ Poor access to institutional credit ○ Lack of cold storage facilities
Opportunity	Threat
<ul style="list-style-type: none"> ○ Elastic demand; economic growth will spur demand ○ Increasing preference for branded dairy products ○ Growing focus on health and nutrients in urban market 	<ul style="list-style-type: none"> ○ Nearly 80 per cent of the Indian dairy industry is unorganized ○ Removal of import duty has led to the threat of dumping

Porter competitive analysis

- Threat of competition is high as there are no entry barriers and consequently there are many brands and local players making up the competitive rivalry
- Threat of substitutes is low as milk is an essential item for beverages like tea, coffee etc. Also traditional consumption habits make milk a favourite with most households in India
- Bargaining power of suppliers is low because suppliers mainly comprise rural households and small co-operatives
- Bargaining power of consumers is high because of competition in the organized sector and large unorganized market in rural areas

Main Players in Indian Dairy Industry

Major players in the dairy sector with dairy products include Gujarat Co-operative Milk Marketing Federation (GCMMF) and Nestle are the largest player. Others include Milk food Limited, SmithKline Beecham Limited, Indodan Industries Limited, H.J. Heinz Limited, Britannia, Cadbury, etc .All other local dairy cooperatives have their local brands (For e.g. Gokul, Warana in Maharashtra, Saras in Rajasthan, Verka in Punjab, Vijaya in Andhra Pradesh, Aavin in Tamil Nadu, etc). Other private players include J K Dairy, Heritage Foods, Indiana Dairy, Dairy Specialties, etc.

Milk products - Amul, Britannia, Vijaya, Verka and Vadilal

Cheese products- Amul, Britannia, Dabur (Le Bon) are the leading players. Other prominent players include Verka, Nandini, Vijaya and Vadilal

Dairy Whiteners - Nestle, Amul, Britannia, Dynamix Dairy, Sterling Agro, Haryana Milk Foods, Mohan Food, Modern Dairy, K Dairy

TABLE III.4 SHOWING CRITICAL ISSUES RELATED TO INDIAN DAIRY

INDUSTRY

	Key success factors	Business concerns	Demand drivers
Liquid milk	<ul style="list-style-type: none"> ○ Sourcing ○ Distribution 	<ul style="list-style-type: none"> ○ Financial distress of co-operatives 	<ul style="list-style-type: none"> ○ Packaging in smaller units
Packaged milk	<ul style="list-style-type: none"> ○ Technology 	<ul style="list-style-type: none"> ○ Small market size 	<ul style="list-style-type: none"> ○ Convenience ○ Health concerns
Milk products	<ul style="list-style-type: none"> ○ Branding ○ Refrigeration 	<ul style="list-style-type: none"> ○ Inadequate infrastructure 	<ul style="list-style-type: none"> ○ Increase in per capita income
Infant milk	<ul style="list-style-type: none"> ○ Education ○ Marketing 	<ul style="list-style-type: none"> ○ Poor penetration 	<ul style="list-style-type: none"> ○ Changing food habits

Regulatory changes

- Dairy sector was de-licensed in 1991
- No industrial license is required for dairy industry
- Foreign equity participation permitted to the extent of 51 per cent in dairy processing sector
- Excise duty on dairy machinery has been fully waived off

For quality of dairy products regulatory environment policy of Government was implemented in the dairy processing sector like compulsory legislation MMPO Act 1992, Food Adulteration Act 1954, Standard on Weights and Measures (Packaged commodities) Rules 1977, Export Quality and Inspection Act 1963, Livestock Importation Act 1898 etc. had work successfully in taking the dairy sector to the international market and compete with the highest. The SPS and TBT agreement in the recent WTO have vastly changed the current international food trade scenario. The importing countries accepted Codex - international food standards and at the same time they imposed (specify) their own requirements on the basis of scientific information. With continuing changes in world dairy production, compositions of consumption and emerging challenges in food safety and quality shifts in consumer requirement of international trade, and these complex things definitely necessitated periodic review and updating of national food control systems and infrastructure support. The various Importing countries stipulates the measures in time to time on Indian exporters, which becomes necessary to fulfill their requirements otherwise returning the products costs more and hard to afford. It also affected the country's trades and which automatically affect the economy.

**TABLE III.5 SHOWING COST INCURRED AND PERCENTAGE OF RETURN FOR
VARIOUS PRODUCTS OF MILK PROCESSING INDUSTRY**

	Name	Capacity	Cost *	Return %
<input type="checkbox"/>	Baby Cereal Milk Powder	150 Ton Baby cereal food 75 Ton Milk Powder/Year	125.00	43.49
<input type="checkbox"/>	Cattle Breeding & Dairy Farm To Produce Milk	40 NOS/day	35.23	31.00
<input type="checkbox"/>	Chocolate	500 Kgs/ day	44.71	41.68
<input type="checkbox"/>	Chocolate Drink	10 MT/day	262.17	42.00
<input type="checkbox"/>	Collection of Milk and Packaging In Polythene Pouches (1 Kg., 1/2 KG., 2 Kg Packs)	18,00,00 Lt./Year Milk and Packaging	55.00	32.31
<input type="checkbox"/>	Condensed Milk (sweetened)	10 T.P.D.	148.00	55.00
<input type="checkbox"/>	Cones For Softy Ice Cream	-	0.00	0.00
<input type="checkbox"/>	Casein From Milk	-	0.00	0.00
<input type="checkbox"/>	Condensed Milk	-	0.00	0.00

	(Sweetened)			
<input type="checkbox"/>	Dairy Farm And Dairy Products	2000 Litrs/day	96.62	29.17
<input type="checkbox"/>	Dairy Farming To Produce Milk For Co-Operative Society	-	0.00	0.00
<input type="checkbox"/>	Dairy Farm	1,51,000 Kg-Ghee, 40,000 Kgs Cheese, 5,00,000 Kg Cream, 8,00 000 Litre Pasturization/Year	238.00	27.34
<input type="checkbox"/>	Dairy Farming	2000 Buffaloes & Milk Product	242.00	27.34
<input type="checkbox"/>	Dairy Farm to Produce Milk in Pouches (50%)& Cans (50%)	1600 Litre Milk/Day by 150 Cows (Jersey)	46.00	25.04
<input type="checkbox"/>	Ice Cream Stabilizers	600 Tons/Year	44.00	49.58
<input type="checkbox"/>	Instant Ice Cream Mix in Various Flavours	-	0.00	0.00
<input type="checkbox"/>	Ice Cream & Ice Candy	-	0.00	0.00
<input type="checkbox"/>	Instant Coffee & Instant Tea (Premixed with Sugar &	1080 MT of Ready Mix Instant Coffee 1080 MT of Ready Mixed Instant Tea/Year	290.00	64.00

Milk)				
<input type="checkbox"/>	Milk Powder, Pasteurised			
<input type="checkbox"/>	Milk, Butter, Cheese & Ghee	30000 Ltrs/day	1,505.91	30.32
<input type="checkbox"/>	Milk Product Cheese	350 Kgs/day	63.49	45.85
<input type="checkbox"/>	Milk Powder	-	0.00	0.00
<input type="checkbox"/>	Milk Preservation and Marketing to Whole Sales (in pouch packing) by UHT Technique	10 T.P.D.	225.00	58.00
<input type="checkbox"/>	Milk Toffee	2 T.P.D.	50.00	35.00
<input type="checkbox"/>	Milk Soluble & Insoluble Powder	150 MTPowder/Year	40.00	24.50
<input type="checkbox"/>	Milk Powder	3000 Tons/Year	225.00	40.00
<input type="checkbox"/>	Non-Dairy Whipping Cream	2 MT/day	210.91	24.34
<input type="checkbox"/>	Non Dairy Whipping Cream	-	0.00	0.00
<input type="checkbox"/>	Pasteurised Milk	-	0.00	0.00
<input type="checkbox"/>	Pasteurised Milk & Cheese	30000 Ltrs Milk for Process	504.01	34.00

<input type="checkbox"/>	Paneer From Milk (Soya Milk)	400 MT of Fresh Soya Milk Paneer/ Year	50.00	62.00
<input type="checkbox"/>	Pasteurization of Milk	Ghee 12 MT Pasteurised Milk 1500 Tons/Year	42.00	30.66
<input type="checkbox"/>	Skimmed Milk Powder	1 Ton/day	102.62	37.08
<input type="checkbox"/>	Softy Ice Cream Cone (fully automatic imported plant)	5 T.P.D.	152.00	50.00
<input type="checkbox"/>	Soya Milk And Paneer	400 MT of Soya Milk/Year	65.00	41.69
<input type="checkbox"/>	Sterilisation of Double Toned Milk	20,000 Ltrs/Day	75.00	30.00
<input type="checkbox"/>	Toffee Candy & Milk Chocolate	500 Kgs 125 MT Hard Candy of Toffee/ 2000 Kgs/of Candies/Day	125.00	37.30
<input type="checkbox"/>	Ice Cream	-	0.00	0.00
<input type="checkbox"/>	Aluminium Milk Can	60,000 Nos 20 Lts. Milk Can 60,000 Nos 25 Lts Milk Can 36,000 Nos 50 Lts Milk Can 18,000 Nos. 100 Lts Milk Can/Year	95.00	67.10
<input type="checkbox"/>	Dairy Equipments	1.Storage Tank (100 Ltrs) Non-Insulated-8Nos. 2. Ghee Setting Tank (1000 Ltrs) 12 Nos. 3. Ghee SettingTank (1000 Ltrs) 3 Nos. 4. Double Can Mixer (100 Kgs/Hr.) 4 Nos 5. Micro Pulverizer (100 Kgs/Hr.) 4 Nos. 6. Evaporating	0.00	0.00

Tank Assorted Size 4 Nos. 7. Butt				
<input type="checkbox"/>	Dairy & Hospital Equipments	1000 Nos-Beds 2000 Nos-Tables 5000 Nos-Chairs 5000 Nos-Curtain Stands 1000 Nos-Dust Bins 5000 Nos-Con-tainers/Year	105.00	60.07
<input type="checkbox"/>	Milk Can	300 Tons Al-Milk Cane 300 Tons Stainless Steel Can/Year	97.00	41.00
<input type="checkbox"/>	Paper Cups For Ice Cream	-	0.00	0.00
<input type="checkbox"/>	Cattle Breeding & Dairy Farm To Produce Milk	40 NOS/day	35.23	39.00
<input type="checkbox"/>	Dairy Farm And Dairy Products	2000 Litrs/day	96.62	29.17
<input type="checkbox"/>	Dairy Farming To Produce Milk For Co-Operative Society	1300 LTS/day	37.04	23.48
<input type="checkbox"/>	Milk Powder	3000 Tons/Year	225.00	40.00
<input type="checkbox"/>	Pasteurised Milk	-	0.00	0.00
<input type="checkbox"/>	Plastic Packings for Ghee Butter Milk	-	0.00	0.00

<input type="checkbox"/>	Tetra Pack for Milk, Ghee and other Liquids Packaging	60,75,000 Tetra packs Printed Bags/Year	150.00	24.24
<input type="checkbox"/>	Dairy Farm & Dairy Products (Milk, Butter, Ghee & Paneer)		0.00	0.00
<input type="checkbox"/>	Soya bean Cultivation & Processing (Nutrela, Panneer & Soya Milk)		0.00	0.00
<input type="checkbox"/>	WHIPPING CREAM		0.00	0.00
<input type="checkbox"/>	MILK PROCESSING PLANT (TONED, DOUBLE TONED MILK, CREAM, BUTTER MILK, BUTTER CREAM, KHOYA, PANEER, GHEE)		0.00	0.00
<input type="checkbox"/>	STERLIZATION OF DOUBLE TONED MILK		0.00	0.00
<input type="checkbox"/>	CREAM FROM MILK		0.00	0.00

<input type="checkbox"/>	PEANUT MILK, KEFIR, FLAVOURED PEANUT, AND MILK BEVERAGE	-	0.00	0.00
<input type="checkbox"/>	MILK PROCESSING PLANT	CAP. 10000 LTRS/DAY	0.00	0.00
<input type="checkbox"/>	Integrated Dairy & Goat Farming	-	0.00	0.00
<input type="checkbox"/>	Milk Pasteurizing Unit	-	0.00	0.00
<input type="checkbox"/>	DAIRY FARMING WITH POWER PLANT BASED ON DUNG	-	0.00	0.00
<input type="checkbox"/>	BUFFALO FARM TO PRODUCE RAW MILK WITH GOBAR GAS PLANT AND BOTTLING OF URINE	-	0.00	0.00
<input type="checkbox"/>	BUFFALO FARM TO PRODUCE RAW MILK WITH GOBAR GAS PLANT AND BOTTLING OF URINE	-	0.00	0.00

Emerging situation

Dairy is currently the top-ranking commodity in India, with the value of output in 2004 at 1.179 billion rupees (US\$39 million), which is almost equal to the combined output value of rice and wheat. Despite the importance of the dairy sector in overall GDP, it receives less government budgeting than the agriculture sector. Further, there has been no concentrated investment in the development of value-added or innovative products, nor any serious effort to support and modernize the informal sector.

In light of the increasing demand driven by the growing population, higher incomes and more health consciousness, the slowdown in dairy industry growth is severely worrisome. Based on estimates by the National Dairy Development Board (NDDB), the demand for milk is likely to reach 180 million tons by 2022. To supply the market, an average incremental increase of 5 million tons per annum over the *next* 15 years is required – a doubling of the average incremental rate achieved over the *past* 15 years. In the absence of sufficient increased production, India will need to rely on the world market for imports. And because of the huge volume required, it will affect global milk prices. Thus, focusing on areas for local dairy development is critical.

Traditionally, the policy environment has favoured the expansion of cooperatives, which ultimately crowded out the private sector. However, liberalization of the sector in recent years has encouraged private investment in dairying. In 2002, the Milk and Milk Products Order (MMPO) ushered in major policy changes friendly to the private sector and a momentum of activity that is likely to increase dramatically in the coming years. Large Indian and multinational corporations, such as Reliance, Pepsi and Coca-Cola, are planning significant investments.

Nowadays, both the private sector and the cooperatives drive the value chains. Because of the many unsuccessful cooperatives in the country, other models of dairy farmer organizations are being explored, such as Mutually Aided Cooperative Societies (MACS) and producer companies.

Millions of small and marginal farmers in dairying who own two to three animals and produce an average of 5 litres comprise a critical portion of India's dairy industry. Livestock development in general and dairy development activities in particular are key components of pro-poor development strategies because livestock distribution is much more equitable than land distribution. Thus, changes in the dairying environment have important implications for the smallholder farmers and for poverty reduction.

The following characterizes India's dairy farming and its relevance to inclusive growth:

- Small and marginal farmers own 33 percent of land and about 60 percent of female cattle and buffaloes.
- Some 75 percent of rural households own, on average, two to four animals.
- Dairying is a part of the farming system, not a separate enterprise. Feed is mostly residual from crops, whereas cow dung is important for manure.
- Dairying provides a source of regular income, whereas income from agriculture is seasonal. This regular source of income has a huge impact on minimizing risks to income. There is some indication that areas where dairy is well developed have less incidence of farmer suicide.
- About a third of rural incomes are dependent upon dairying.
- Livestock is a security asset to be sold in times of crisis.

Factors affecting the competitiveness of the dairy sector

To assess the dairy sector's competitiveness, a performance analysis looked at five factors: demand conditions, market structure, factor conditions, related supporting industries, and government and the enabling environment.²¹

Demand conditions

Demand for dairy products in India is likely to grow significantly in the coming years, driven by more consumers, higher incomes and greater interest in nutrition. Consumption of processed and packaged dairy products is increasing in urban areas. Because of the increasing competition from the private sector, several national and international brands have entered the market and expanded consumers' expectation of quality – although only among a small proportion of the population. In many parts of the country, people still prefer unpacked and unprocessed milk delivered by a local milkman because of its taste and the perception of freshness. The price elasticity for milk is high, thus demand for milk is very sensitive to price changes

TABLE – III.6 SHOWING THE DEMAND CONDITIONS FOR DAIRY PRODUCTS

Demand conditions	
Market size and growth	Market growth is due to high per capita consumption, increasing population and health consciousness
Consumption patterns	Consumption of processed and packaged dairy products is increasing in urban areas
Consumption patterns	Unpackaged milk is still preferred because of taste and price
Sophistication of consumers	Consumer awareness on product quality is increasing but in a very small portion of the population
Receptivity to new products	Mostly urban consumers have a very low but increasing interest in new products
Price elasticity	Price elasticity is high
Impact of market opening on demand	Consumers now have a variety of quality products

TABLE – III.7 SHOWING THE MARKET STRUCTURE OF DAIRY PRODUCTS

Market Structure	
Performance	Still large share of produce; 85% of marketable surplus goes through informal channel
	Quality of milk through informal channel is an issue and to some extent in formal channel as well
Competitive structure	Little competition to cooperatives because private sector was not allowed in the sector until recently
	Entry of supermarkets in retailing of milk is increasing the competitive structure
Governance (value chain type)	Governance of cooperative structures is constaining efficiency and expansion
Role of "lead" or organizing firms	Role of lead agency has been hampered by government interference in cooperatives
Farmer organization	Immense scope for improving management and governance through farmer organizations
Marketing chain capacity and efficiency	Scope for enhancing efficiency of distribution
Distribution channels	Cooperatives have a well-developed distribution channel in urban areas
How market signals are conveyed or distorted	Government and political interference in price setting, limits prices being determined by market forces.

Market structure

Until 2002, cooperatives traditionally were the dominant players in the formal sector. With liberalization of the dairy industry, private investment has increased quite significantly. However, the organized sector's share in milk procurement is very low because a large proportion of the milk and milk products are sold through the informal channel (Table 3). The informal demand absorbs approximately 41 percent of the milk and milk products produced in the country, accounting for about 75 percent of the marketable surplus of milk. The formal channel, with its packaged milk and dairy products, accounts for only about 25 percent of the marketable surplus, which is about 15 percent of production.

The informal sector consists of the village milk vendors who procure loose milk from farmers and sell it in urban and peri-urban areas directly to consumers, small private processors or hotels. The milk vendors also may sell processed products, such as paneer or separated cream. The quality of the vendors' milk and milk products is not guaranteed. Largely sold in loose form, it is often adulterated with several additives to control spoilage.

TABLE – III.8 SHOWING THE CHANNELS THROUGH WHICH MILK FLOWS

Flow of milk through different channels			
Share of marketable surplus	% of production	Total production (million tons)	Use
	100%	100	
	45%	45	Home consumption
	55%	55	Marketable surplus sold in urban and rural markets (informal and formal)
34.5%	19%	19	Sold in urban markets as loose unpackaged milk
40%	22%	22	Sold as processed products through informal markets
14.5%	8%	8	Sold as packaged milk through formal markets
12.7 %	7 %	7	Sold as packaged milk products through formal markets

Cooperatives are the central players in the formal dairy sector. The cooperatives have a three-tier structure – i) primary societies at the village level, ii) unions at the district level and iii) federations at the state level. Currently, there are 14 federations in India.

Of the 14 major state cooperatives in the country, 10 have state government equity, of which 6 have government equity in excess of 51 percent. Twelve of the 14 cooperatives have government officers as managing directors who are appointed by the state government. It is not uncommon for these officials to change up to three times a year. Because of such governance, cooperatives are mere parastatals and do not work in the true spirit of cooperatives – with elected farmer representatives and professionals who run the organization.

Factor conditions

The quality of animals is critical in determining its milk productivity and hence overall production. Currently, low productivity per animal hinders development of the dairy sector. Despite being the world's largest milk producer, India's productivity per animal is very low, at 987 kg per lactation, compared with the global average of 2 038 kg per lactation.

The low productivity is a result of ineffective cattle and buffalo breeding programmes, limited extension and management on dairy enterprise development, traditional feeding practices that are not based on scientific feeding methods, and limited availability and affordability of quality feed and fodder. In addition, the limited supply of quality animals is exacerbated by policies limiting interstate movement of animals. Indigenous cattle and buffalo make up 45 percent of the country's total milch population, in contrast to the cross-bred cows at 10 percent.

Animal health and breeding services provision, veterinary infrastructure development and vaccinations are the responsibility of the state government. These services have traditionally been provided for free or at a very subsidized rate. In the past few years, there has been increasing awareness that the state pays heavily to offer these services, which are easily available

to farmers (Ahuja *et al.*). Consequently, many states have instituted partial or full-cost recovery fees for providing the services.

In addition to the State Department of Animal Husbandry, Dairying and Fisheries, the milk cooperatives and NGOs (BAIF, JK Trust) provide services in many states. So do trained private sector AI technicians, although for a fee. As well, state livestock development agencies are being set up as autonomous bodies to offer services in animal breeding in the form of procurement, production and distribution of breeding inputs (such as semen and liquid nitrogen), training and promotional activities.

Despite these initiatives, the availability of services remains limited. Currently, AI services cover only 15 percent of the breed able animals. Cattle and buffalo breeding programs have been initiated but have not had the desired impact because of a lack of coordination between the different state departments. And extension activities in dairy management are woefully lacking. Farmers have not been able to take advantage of the potential of their animals because they lack information on feeding and management practices. Extension, especially for women involved in livestock rearing, would enhance dairy production considerably.

Crop residues are the single largest bulk feed material available to farmers for feeding livestock, specifically ruminants. They include coarse straws, fine straws, leguminous straws, pulses straws and sugarcane tops. Fodder from common property resources is another major source of feed for animals. But lack of efficient management of common property resources is a major constraint in availability of these resources for fodder. The area under cultivated fodder production is limited only to 5 percent of the total cultivable land. In the states of Haryana, Punjab, Gujarat and some parts of Rajasthan, land use for green fodder production is estimated at

10 percent or more. There is a need for restructuring the land use strategy to elevate the overall proportion of cultivable lands for fodder production.

Concentrates used for fodder include coarse grains, such as maize, sorghum, bajra and other millets, and other cereal by-products, such as rice bran/polish and various oil meals, including groundnut cake, mustard cake, coconut cake, soybean meal, cotton seed meal and sesame cake. The escalating price of feed ingredients is a major cause for concern. In many states, cooperatives are involved in producing feed concentrate and selling to farmers at subsidized rates.

Scarcity of fodder resources is likely to be a major constraint in the development of the dairy sector unless adequate measures are undertaken to augment them. Another important issue regarding feed is the lack of regulations to ensure quality. In the absence of a coherent policy, all kinds of substandard feeds are available in the market.

Formal/informal credit: Lack of access to credit to expand the herd is a critical problem for farmers. There is little access to formal credit through the cooperatives. Informal credit is available from private traders and agents of private companies, but the interest rate is very high. And these loans may or may not be linked to dairy activity. When taking a loan from a trader, the farmer is then tied to selling the milk to that trader, often at a low rate. The *Working Group Report on Animal Husbandry* emphasizes the low or non-availability of credit as a primary constraint in livestock sector activity, indicating that: “Public sector lending is abysmally very low. The commercial banks are not favorably disposed to providing credit to livestock farmers and the cooperative credit system is very weak, resulting in excessive dependence of livestock farmers on informal sources [and] usually at exorbitant interest rates. Efforts should be put on

TABLE – III.9 SHOWING THE FACTOR CONDITIONS

Factor conditions	
Herd	
Herd inventory	Very large number of indigenous animals with low productivity and a small portion of cross-breeds
Breed	Lack of policy focus on strengthening indigenous breeds
	Very poor awareness of quality feed, which hinders productivity
Feed	Farmers not interested in quality feed because of the low price of milk
	Increasing feed costs
Veterinary medicine	Availability is not an issue
Veterinary medicine costs	Duplicate or cheap medicines
Human capacity	
Farmer technical capacity	Knowledge and new techniques are not accessible
Support services technical capacity	Accessibility to good quality veterinary services is an issue in many parts of the country
Organization and managerial capacity	Organizational and managerial capacity of farmer cooperatives is very poor
Entrepreneurial capacity	Entrepreneurial capacity is hindered by a low capacity to take risks
Credit or finance market	
Formal credit mechanisms	Access to formal credit mechanisms is very poor
Informal credit mechanisms	Accessible but at very high interest
External economies	
Transmission of learning	Very poor extension support services, leading to very poor knowledge transfer
Social capital and trust	Strong social capital and trust in the villages, which can sustain dairy farmer organizations if properly managed

correcting these distortions and ensure timely availability of inputs and services, including credit to livestock.”

Vaccines/medicines: The Government and the private sector are involved in producing medicines and vaccines. However, quality control is a critical issue. An important policy question is whether the government should be involved in the manufacturing and production of vaccines or should it instead take on a regulatory role to ensure quality and availability at a reasonable price.

Related supporting industries

TABLE – III.10 SHOWING RELATED AND SUPPORTING INDUSTRIES TO DAIRY INDUSTRY

Related and supporting industries	
Processing capacity	Lack of processing capacity in the country, including primary processing by bulk chilling
Processing capacity	There are government subsidies on bulk chilling and processing infrastructure
Transportation and distribution	Because of low productivity, transportation costs for procurement are high
Dairy farmer services	Availability of health and breeding services could be enhanced; extension is almost non-existent
Specialized finance and credit	Exists on paper but is very difficult to access
Relevant research capacity and use	Good research capacity

Strong supporting industries are critical for the development of any industry. In the case of dairying, the National Dairy Research Institute pursues research and education in all aspects of dairying: microbiology, chemistry, technology, engineering, animal genetics and breeding, livestock production and management, animal nutrition, animal physiology, dairy economics and dairy extension education.

Processing capacity: At present, there are 678 registered dairy processing units processing 12–15 percent, or 26.63 tons, of the milk produced in the country each year. Of the total units registered under the MMPO, 403 are private dairies processing around 11.83 tons per year, whereas 212 cooperative dairies process 10.36 tons per year. The remaining 63 government plants process 4.44 tons per year. These dairy plants are registered in the different states of India. There is immense scope to increase the processing capacity and direct a greater share of milk and milk products through the formal channel.

Primary processing is another factor in need of critical attention to ensure the quality of milk through the supply chain. In addition to the Clean Milk Programme and other rural development schemes, the Government has provided subsidies for bulk chilling and processing infrastructure to support the dairy industry. But credit remains a problem; specialized credit exists on paper but is difficult to access for dairying. There is significant private sector investment in feed manufacturing and the manufacturing of medicines and vaccines.

Government and the enabling environment

The dairy sector in India has traditionally been highly regulated. The government projects and programmes in place for enhancing dairy development include subsidies for developing

infrastructure for milk processing and testing. The Clean Milk Production Programme is a centrally sponsored scheme that is being implemented by the State Department of Animal Husbandry, Dairying and Fisheries with several objectives: i) the creation and strengthening of necessary infrastructure for the production of quality milk and milk products at the farm level up to the points of consumption; ii) improvement of milking techniques; and iii) training to enhance awareness on the importance of hygienic milk production. Several other rural development initiatives support dairying, such as through the District Rural Development Agency and women's self-help groups.

An area of government support that has not been capitalized on so far is the investment in promoting the nutritional aspects of milk, particularly pasteurized milk versus loose milk.

The policy history

Until 1991, the dairying sector was licensed under the Industries Development and Regulation Act (IRDA, 1951). This resulted in preferential treatment given to milk cooperatives that were outside the purview of the legislation. In 1991, the dairy sector was swept up in the move to liberalize the economy. Consequently, the IRDA was replaced by the Milk and Milk Product Order in 1992, which contained the following provisions:

1. The main objective of the MMPO is to maintain and increase the supply of liquid milk of desired quality in the interests of the general public and to regulate the production, processing and distribution of milk and milk products.

2. Any person or dairy plant handling more than 10 000 litres of milk per day or 500 tons of milk solid per annum needs to be registered, with the registering authority appointed by the central Government.
3. Every holder of a registration certificate can collect or procure milk only from the milk shed assigned under the registration certificate. The milk shed, is defined as "an area geographically demarcated by the registering authority for the collection of milk or milk product by the holder of a registration certificate".

Amendments were made to MMPO in 2002 to further liberalize the sector and encourage dairy entrepreneurs from the private sector. The milk shed concept was abandoned, allowing for milk supplies to be procured from any area.

Traditionally, the cooperatives have not had much competition from the private sector. In the liberalized environment characterized by open procurement of milk, there is incentive for private players to invest in the sector. Consequently, many agencies, organizations and agents have started buying milk. But a major difference is that they are not backward investing in dairy development activities through the offering of producer services. In the coming years, the lack of involvement in dairy development by the various players is likely to constrain further growth of the industry.

In this environment, dairy farmer organizations and cooperatives will have a strong role to play in supporting dairy development activities. If they were to establish higher prices to farmers, for instance, the private sector and other players would be forced to pay at least that much as well.

Policy and regulatory issues

TABLE –III.11 SHOWING ENABLING ENVIRONMENT

National sector regulation	
Key regulatory actors (ministries)	Department of Animal Husbandry is under the Ministry of Agriculture, hence focus on livestock is underemphasized, particularly in light of the high value of the sector.
Price regulation	Rice setting by cooperatives
Food safety	Regulated through the Milk and Milk Products Order
Informal regulations	Very difficult to control quality in traditional channels Huge premium on fat content of milk compared with formal regulations; thus buffalo milk fetches much higher price
Formal sector support	
Domestic sector (national)	Approaches being taken to modernize the sector
Subsidy support	Various subsidies available for milk processing and testing infrastructure
Inward investment promotion	Very little investment on the promotion of health or quality of milk
Provincial/local	
Key regulatory actors (ministries)	State Department of Animal Husbandry, Dairying and Fisheries is the implementing agency at the state level
Informal regulation & transparency	Lack of milk testing equipment and thus transparency, leading to low payments
Formal sector support	Availability of veterinary services; paravets are working with the Department of Animal Husbandry. Dairying and Fisheries
Formal sector support	Availability of services in remote areas through the government
Donor/NGO roles	Donor agencies are very actively involved in livestock sector development

Agriculture is a state responsibility in India, and the State Department of Animal Husbandry, Dairying and Fisheries, within the Ministry of Agriculture, is responsible for the dairy activities. Consequently, the focus of the activities and budgetary allocation is biased towards agriculture rather than livestock.

There are several issues related to milk pricing policies that require serious review and reconsideration. Because cooperatives are mostly managed by civil servants, there is some government influence in determining milk prices. But the state cooperatives are supposed to base the price paid to farmers on the fat and solid-not-fat (SNF) content of milk. In the case of the better-managed cooperatives in Gujarat, the system works that way.²² However, it is less the practice elsewhere. As noted previously, the village society president often wields a lot of power and determines the price randomly, without testing the fat or SNF content.

SUMMARY AND POLICY IMPLICATIONS

Milk processing industry in India derives its significance from its high potential for employment at low capital cost, use of local resources, possibilities for forward and backward linkages and its scope for earning more output. With a share of about 14 per cent in world milk production. Milk has achieved a unique status in terms of its output value exceeding Rs.1,00,000 crores and has made a rapid stride both in terms of number of milk producers and quantity of milk produced.

The milk production in India was 17 million tons in 1950-51. This could meet only 25 per cent of the domestic demand; the remaining 75 per cent of the demand was met by importing the milk solids. The production was stagnant for two decades till 1970, with annual growth rate of milk production of one per cent. Thanks to the vision and foresight of Dr.Kurien, in 1970

NDDDB launched “Operation Flood Programme” with the objective of ending milk famine in the country and turning farmer’s co-operatives into a powerful catalyst for transforming India into a major milk producer in the world. Further, by providing milk producers a remunerative price round the year, milk production in India touched 74 million tons in 1997. By the year 2006, India has emerged as the largest milk producer with a production of 100.9million tons. This is as a result of India’s “White Revolution” in milk production.

Also as previously mentioned, the cooperative price becomes the benchmark price for other buyers (vendors and private dairy agents) and when it is low, so are the other prices paid. Thus there is no incentive for farmers to sell to the other buyers; only about 15 percent of the milk is sold this way for the marketing of packaged milk and milk products. Policy efforts should focus on enforcing testing as the basis for milk pricing. This can be achieved by ensuring availability of testing machines at all milk collection centres, educating farmers to sell milk only based on testing and setting up policy norms for all players in the sector to collect milk only when it has been tested.

Another important aspect of milk pricing is the huge premium on the fat content compared to the non-fat solid content. Thus buffalo milk fetches a much higher price than cow milk, which has lower fat content.

The Dairy Industry has a bright future in India and is a viable alternative for farmers because of low cost of production. There is a huge potential for capturing the large unorganized market base in dairy.

TABLE III.12

SHOWING INDIAN MILK PRODUCTION BY STATE (IN '000 TONS)

State	2008-2009
All India	1,08,463
Andhra Pradesh	9,570
Arunachal Pradesh	24
Assam	763
Bihar	5934
Goa	59
Gujarat	8396
Haryana	5745
Himachal Pradesh	884
J & K	1498
Karnataka	4538
Kerala	2441
Madhya Pradesh	6855
Maharashtra	7455
Manipur	78
Meghalaya	77
Mizoram	17
Nagaland	53
Orissa	1672
Punjab	9387
Rajasthan	9491
Sikkim	49
Tamilnadu	5673
Tripura	96
Uttar Pradesh	19537
West Bengal	4176
A & N Islands	26
Chandigarh	47
D & N Haveli	4
Daman & Diu	1
Delhi	285
Lakshadweep	2
Pondicherry	46
Chattisgarh	908
Uttaranchal	1230
Jharkhand	1466

National Dairy Development Board (2010). *National Statistics*. Retrieved 16 Jun 2011, from <http://www.nddb.org/statistics.html>

CURRENT SITUATION OF DAIRY PROCESSING INDUSTRY IN ANDHRA PRADESH

The primary occupation of the people in Andhra Pradesh is agriculture. The total reported population of Andhra Pradesh is reported to be around 9.5 crores. People of rural areas and the landless agricultural labours take up dairying as a source of supplementary income. The main reason underlying the supply of milk to the dairies by the people is that milk cannot be preserved for longer periods of time further sophisticated technology is required to preserve the milk.

The Milk production in Andhra Pradesh has gone up from 72.57 Lakhs MTs in the year 2004 to 112.56 Lakhs MTs in the year 2011. For sustaining further development, Dairy Industry has to cope with the rapid transformations that are taking place in Indian Economy.

Our Dairy farmers are being benefited from different Dairy Development schemes in India. State has spent about 93 Crores for development of dairy activities through APDDCF during the last seven years on various schemes like Pasu Kranti Patham, CM Package, PM Package, IDDP, RKVY etc to increase the milk production and productivity by providing suitable infrastructure, forward and backward linkages for Milk producers in Milk procurement, providing marketing facilities and capacity building etc. By implementing the above schemes, Federation is procuring an additional milk of about 70000 and about 40000 milk producers were benefited under various programmes.

Under National Dairy Plan, proposals have been made to increase the Milk Production and productivity further and increasing the organized sector's share in Milk marketing. Establishment of new BMCUs and expansion of marketing facilities in II tier and III tier cities

with an outlay of Rs.723.00 Crores is proposed in the coming next 4 years. Under MGNREGS program, it is planned to mobilize the villages to be self sufficient in fodder production through development of fodder nurseries, bund plantation, perennial fodder crops and fodder conservation with an outlay of Rs.965.00 Crores in the coming next 4 years.

Further RKVY Project functioning since 2007-08 is providing initiatives in dairy development activities. 68 Bulk Milk Cooling Units were established duly covering 1318 new villages. Modernization of the Milk Products Factory, Hyderabad has been taken up in this scheme to improve the Milk Processing and quality apart from establishment of One UHT Milk Packing station. Further proposals have been made for additional milk chilling and processing facilities by establishing Three

New Milk Chilling Centers- at Madakashira and Kalyanadurgam in Anantapur District & Polakal in Medak District. Similarly Special initiatives will be taken up for development of dairy sectors in Warangal and West Godavari districts by further establishments of New BMCU's.

Access to significant technological innovations, development and creation of infrastructural facilities were also given considerable boost to dairy development. Animal health and quantity breeding practices were also contributed for further development of dairy activities. This made our country to reach the distinction of being the highest Milk producer in the world with an average growth rate of 4-6 percent per annum. In terms of Milk Production, more than 110 million tones of milk in India during 2010-11 and Andhra Pradesh stands at 2nd position in India. This helped in improving quality of life of the rural public apart from employment generation amongst the rural people. The State Government of Andhra Pradesh is planning to launch a state wide milk mission with a target to increase milk production.

MACS in Andhra Pradesh (AP)

Dairy activities started at the district level in 1971. The originally chosen district union was registered under the Andhra Pradesh Cooperative Societies Act (1964). After the introduction of the MACS Act (1995), the district union opted for registration as a MACS to acquire better functional autonomy for servicing its farmer members. The union is currently collecting 60 000 litres of milk per day from 650 villages, though it likely to increase up to 100 000 litres in the next two to three years.

The MACS have a two-tier operation: at the village and district levels. A village society with elected officers manages operations at the lower level; an elected board of directors manages the district society. The village and district societies each registered separately, and each has the freedom to use its own profits.

The union provides its members with a range of services required for dairy development activity:

- organizing thrift and credit cooperative society to facilitate the financial assistance for buying milch cattle;
- organizing AI services through an NGO;
- making cross-breed or graded animals for farmers to purchase;
- providing inputs such as concentrate feed, fodder seed, fodder slips and mineral mixtures at subsidized rates to members;
- supplying breeding bulls to societies;
- providing veterinary health facility, de-worming and vaccination to the animals of members;

- compensating members in the event of the death of an animal with either a grant or loan;
- providing insurance coverage to members.