

Supply Chain Management in a Cooperative Farming, Processing and Distribution Environment

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Background

Globalization & liberalization Impacts:

- Food market dynamics - changes in demand & supply
 - Competition from new entrants and new products
 - Consumers 'laddering-up' and substituting 'new' products, greater consideration of diet-health issues
- Food markets - undergoing transformation from low-value basic essentials to market segments demonstrating wider-variety of value-added and processed foods. This has enforced food producers and marketers to reassess their position and adopt 'new' strategies.

Competitiveness of organizations

- Strengths and capabilities of individual organizations
- Work with other organizations having unique but complementary capabilities

(Hunt, 1995, 2000; Hunt and Morgan 1995).

What is SCM?

- Captures holistic farm-to-fork perspective of food production and marketing; movement and exchange of products and knowledge from farms to final customers; links markets, distributors, manufacturers/processors and producers.
- SCM Efficiencies cause value chain transformation, systems efficiencies in the value chain and facilitate integration of different actors and activities leading to greater capacity utilization and operating efficiencies.
 - Supply chain efficiencies impact capacities of individual organizations to match customer demands
 - Competition in the new age will increasingly be between supply chains rather than individual organizations (CDPIE, 1998).

SCM-Contd.

- Regulatory, structural, cultural, historic, logistic, resource and organizational characteristics influence performances and capabilities of intermediaries in the supply chain.
- Owing to interdependence, actions of any intermediary can influence the operations of other linked organizations so it is important for all organizations in the supply chain to share a common vision (Brito, 2001; Reason, 1999).
- Learning and innovations within supply chains can be the outcome of on-going efforts by organizations to co-ordinate the activities or these decide to completely overhaul existing systems & create new modes of engagement (Lundgren, 1992).

Agricultural Products

- Farmers pictured as at the base of the supply chain pyramid need access to specialized information, technology, knowledge, assets, institutions, infrastructure and credit to respond efficiently to customer demand and compete in global markets (Hulse 1999; IFPRI 2001).
- Farmers are constrained by poor information about markets, inexperience in negotiating deals and inert inability to collaborate with other organizations to increase their capacity to efficiently access markets (IFAD 2001).
- Vertical co-operation enables downstream channel members to share market knowledge with upstream members and develop strategies and tactics that successfully match offerings to the needs and demands of target markets (Etgar, 1976).

Study Objectives

- To explore the influence and effects of environmental dynamics (deregulation, industry consolidation and the increased levels of competition) and market dynamics (increasing purchasing power and changing food consumption needs) on dairy sector.
- How do dairy co-operatives being highly successful in developing the marketing capabilities of the small-to-medium scale dairy enterprises are using SCM practices to cope with the market dynamics.

Data Sources

- Primary data collected from the key informants in Punjab State Milk Federation (Milkfed) and secondary data from the websites of the NDDB, Milkfed and other organizations.

Results and Discussions

Milk Cooperatives - India

- In 1965, a network of dairy cooperatives that replicated Anand model in Gujarat with a three-tiered structure - State Milk Federations (15), District Level Milk Unions (170), and Village Level Primary Cooperative Societies (117,575) was introduced throughout India.
- Producer-owned but management in the hands of individuals recruited on the basis of management expertise and competence. Farmers represented in the operational hierarchy to ensure returns to be predominantly returned to them.
- National level organizations - NDDDB and NCDFI spearhead and coordinate all State levels.

Milk Cooperatives – India Contd

- Cooperatives provide employment to approx. 70 Mn households many are semi-literate/illiterate.
- Milk production increased from 21.2 Mn tonnes in 1968-69 to 97.07 million tonnes in 2005-06 thereby per capita availability from 112 gm to 241 gm.
- Market development for many products presents unique challenges because demand is highly price sensitive. Milk production is pre-eminently a small-scale business so a large numbers of farmers need to be linked together to generate sufficient scale economies, increase efficiency and price competitiveness.
- To increase value addition, reduce price elasticity of demand, increase customer loyalty and reduce switching behavior, State Federations initiated strategies such as brand development, brand recognition and brand positioning - Amul, Vijaya, Verka, etc.

Table1: Milk Production, Cooperatives' Procurement and Marketing, 2005-06

State	Production (Million kg)	Procurement		Marketing	
		Quantity (Million kg)	Share (%)	Quantity (Million kg)	Share (%)
Uttar Pradesh	17,356	302	1.74	143	47.26
Punjab	8,909	286	3.21	175	61.05
Rajasthan	8,713	568	6.52	337	59.26
Andhra Pradesh	7,624	397	5.20	375	94.60
Gujarat	6,960	2,351	33.78	782	33.24
Maharashtra	6,769	1,023	15.11	913	89.28
Madhya Pradesh	6,283	167	2.65	105	62.72
Tamil Nadu	5,474	761	13.90	501	65.77
Haryana	5,299	148	2.79	92	62.46
Bihar	5,060	202	3.99	101	49.86
Karnataka	4,022	1,081	26.87	568	52.58
West Bengal	3,891	123	3.15	234	191.21
Kerala	2,063	279	13.52	282	101.01
Orissa	1,342	74	5.52	52	70.83
INDIA	97,066	7,828	8.06	5,583	71.32

Private Sector

• Since liberalization of the dairy sector companies such as Nestlé India, HLL, Hatsun Agro, Britannia and Vadilal have established /expanded milk-processing facilities. This has introduced new competitive forces by way of price discounting, wider variety of product offerings and integrated marketing initiatives.

Examples in liquid milk category (Rs 3,600 billion).

- In South India, Nestlé introduced brand name 'Pure Milk' at a price of Rs 21 per litre, cheaper than the competing offerings from the cooperative sector, Amul's 'Taaza' (Rs 22), APDDCF's 'Vijaya' (Rs 23).
- HLL in collaboration with Hatsun Agro introduced a scratch card scheme of 200 ml/500 ml free milk packet for purchase of gasoline valued Rs 100 or more at the select Club HP outlets.
- Britannia introduced flavored milk under the brand name 'Milkman' to position milk as a thirst quencher or energizer to be consumed at any time of the day.

Milk Procurement

• Milk processors introduced sourcing strategies to enhance competitive position.

- Britannia's joint-venture procure supplies from regional dairies - Modern Dairies Ltd (Karnal), Sri Mahalakshmi Dairy (Kerala) and Thacker Dairy (Kolkata).
- Hatsun Agro is addressing through increased farm sizes, making available in-puts and increasing productivity. It launched a five-year project titled 'White Gold' through facilitating larger and more economic herd sizes, improved feeding practices and selective mechanization of farm practices. It plans to encourage the start-up of owner-operated farms of about five-acres each that will also cultivate cattle feed.
- Nestlé procures about one million litres milk daily through a network of CAs. Company supports farmers through providing various input supplies and extension service such as milking machines at 25% subsidy, has invested heavily in milk shed and commissioned cooling tanks on farms to improve milk quality.

Punjab State Milk Cooperative

- Milk cooperative's structure comprises of - State Federation, District Co-operative Unions (eleven with nine milk Plants - handling and conversion capacities of 1.52 and 1.06 million litres per day, 35 milk chilling centers, 152 BMC and a network of VCS.
- Main objective to provide fair returns to the dairy farmers. To achieve this cooperative establishes operating controls and measures including annual targets, exploring untapped potential areas in the markets, building or strengthening cooperative structures at the grass root levels and continually monitoring and addressing weaknesses in its existing operations.
- Core activities are processing of liquid milk and milk products; marketing - advertising, promotions, operations planning and associated research and development
 - Earlier focused on fresh milk, ghee and milk powder; Product Portfolio has gradually been extended to include of high value and differentiated products.

Table2. Punjab Milk Cooperatives' - Product Category

Products	Packing
Milk	Standard, Toned, Double Toned, Punjabi Premium. 200 ml. Bottle, 200 ml. Tetrapak
Sweetened Flavoured Milk	
Whole Milk Powder	500 gms. Tin, 1 Kg. Tin, 10 Kg. Tin
Skimmed Milk Powder	200 gms. & 500 gms. Bottle, 500 gms. 1 Kg. Pkt. & 25 Kg. Bag
Dairy Whitener	500 gms. Pkt. & 10 Kg. Tin
Ghee	500 gms, 1 Kg, 2 Kg., 5 Kg & 15 Kg; Poly Pack/Mono Carton
Table Butter	10 gms, 100 gms. & 500 gms.
Cheese	200/400 gms. Container, 200 gms. Singles, 400 gms Tin, & 1 Kg. Brick
Pizza Cheese	200 gms. & 1 Kg. Pack
Sweet Lassi	200 ml. Tetrapak
Raseeela - Mango, Pine Apple.	200 ml. Tetrapak
Verka Vigour	500 gms. Jar, 500 gms. Refill & 1 Kg. Jar
Sweets	
Milk Cake /Peda	200 gms Pkt.
Kaju Pinni	50 gms. Pkt.

•Third party Reliance for support activities - logistics for milk collection, distribution of milk and milk products having longer shelf life, making farmers available veterinary & animal husbandry services.

➤Mechanisms developed to retain channel control, ensure product quality and timely deliveries. All sales on cash and products not dispatched without advance.

Marketing

➤Within the state of fresh products such as milk, curd, butter, lassi through own outlets, other retailers and fairs.

➤Outside the State through distributors and a network of regional offices. SMP a premium price product.

➤Penetration to the export markets, currently only ghee is exported because of shortages of milk supplies,

Measures - Increase Milk Supplies

Short-term:

➤Setting up of fair procurement prices to provide reasonable return to member farmers and making prompt cash payments.

➤Commissioned 1005 AMCS - more accurate, transparent and speedier.

Long-term:

➤Organize village level campuses to educate member farmers - improve milk productivity and quality; provide technical input services in artificial insemination for improving cattle and buffalo breed, prophylactic vaccination, balanced cattle feeds and fodder seeds.

➤Set up two cattle feed plants (both have obtained ISO certification), urea molasses lick brick plant, automatic seed processing plant

➤Works with partner institutions in making available support services to member producers. For example, MoU signed with the State Bank of India, State Bank of Patiala and the Oriental Bank of Commerce for providing non-secured loans

Milk Processing and Disposal.

- Of eleven Unions except in Faridkot and Ferozepur districts all others have own plants located at the district headquarters except for Ropar Union(Mohali)
- Fresh milk products - fresh milk, ghee, curd, paneer and lassi processed in all plants; some level of specialization with certain products manufactured in some plants determined by the availability of specialized facilities such as cold storage, insulated vans, etc. Under NDDB's technical guidance the Ludhiana Milk Union introduced the Quality Assurance Programme (QAP).
- Unions control pricing decisions and distribution of liquid milk, Milkfed coordinates the activities of the Unions while the pricing decisions of products with longer shelf lives.

Milk Procurement and Utilization

2006-07

- Milk handled 333.88 million kg.
 - Ludhiana (33.45%), Ropar (22.76%), Patiala (8.04%) Jalandhar (7.95%), remaining five plants about 5% each.
- Milk procured 284.10 million kg.
 - Ludhiana (25.02%), Ropar (22.65%), Jalandhar (7.66%), Amritsar (6.74%), Patiala (6.19%), remaining four plants about 5% each.
- Milk supplied fresh in the cities 212.17 million kg -about 75%. Milk the most profitable product.
 - Ropar (31.44%), Ludhiana (28.87%), Patiala (9.95%), Jalandhar (9.86%), Gurdaspur (5.79%), Hoshiarpur (5.03%), Amritsar (3.97%), Bathinda (3.37%) and Sangrur (1.70%).
 - Milk conversion into value-added products: Ludhiana (39.63%), Amritsar (12.35%), Bathinda (11.63%), Sangrur (9.43%), Hoshiarpur (8.67%), Ropar (7.83%), Patiala (6.28%), Gurdaspur (3.79%) and Jalandhar (0.38%).

Table3: Punjab Cooperatives' Capacity, Milk Handling, Procurement and City Supplies ('000 lpd) during 2006-07

Plant	Milk Handled	Procurement	Milk Converted	City Supplies	Capacity		Hand. Capacity Utiliza. (% age)	Conver. Capacity Utiliza. (% age)	City supplies/ procure. (% age)
					Handling	Conver			
Milkfed	914.70	778.36	202.90	581.30	1525	1059	60	19	74.68
Ludhiana	306.00	194.76	80.40	167.80	400	365	77	22	86.16
Jalandhar	72.70	59.64	0.80	57.30	300	240	24	---	96.14
Sangrur	51.00	43.27	19.10	9.90	150	93	34	21	22.83
Gurdaspur	45.60	34.62	7.70	33.70	150	92	30	8	97.24
Bathinda	51.60	44.36	23.60	19.60	125	65	41	36	44.15
Hoshiarpur	208.20	176.29	15.90	182.70	100	80	208	20	103.64
Ropar	73.50	48.15	12.70	57.80	100	14	74	91	120.04
Patiala	54.10	35.29	17.60	29.40	100	10	54	176	83.31
Amritsar	52.00	52.44	25.10	23.10	100	100	52	25	44.01
Ferozepur		45.76							
Faridkot		43.79							

Monthly Milk Procurement & Utilization

- Average daily milk procurement higher for six months - November to April. Milk supplies start increasing from November peak in March and thereafter start declining.
- Average daily fresh milk supplies comparatively stable throughout a year, marginally higher for the six months from May to October when procurement is low.
- Fresh milk supplies exceed procurement for four months from June to September, the highest for the months of July (32.8%) and August (22.61%). Fresh milk supplies maintained by converting milk powder into liquid milk.
- Milk procurement exceeds the fresh milk supplies - May and October (about 15% each), April and November (about 35% each) and December to March (about 43% to 47%).

➤ Plant wise average milk handling capacity utilization - 45%-78%, milk conversion capacity utilization - 2%-45%.

Table 4: Milk Federation's Average Milk Handled, Converted, Procurement and City Supply ('000 lpd) during 2006-07

Month	Milk Handled	Procurement	Milk Converted	City Supplies	Handling Capacity Utilization (%)	Conversion Capacity Utilization (%)	City supplies/ procurement (%)
April	1018.20	889.67	202.90	566.80	66.77	19.16	63.71
May	809.60	672.32	66.20	577.50	53.09	6.25	85.90
June	718.80	526.47	32.40	586.80	47.13	3.06	111.46
July	675.80	454.90	49.80	604.10	44.31	4.70	132.80
August	693.50	502.65	25.30	616.30	45.48	2.39	122.61
September	760.50	603.53	22.50	610.60	49.87	2.12	101.17
October	806.10	675.97	65.00	578.80	52.86	6.14	85.63
November	1001.20	869.53	281.00	559.40	65.65	26.53	64.33
December	1062.80	979.58	371.10	560.00	69.69	35.04	57.17
January	1094.80	1020.26	411.00	554.20	71.79	38.81	54.32
February	1172.10	1072.82	459.40	576.10	76.86	43.38	53.70
March	1183.30	1093.94	463.80	584.40	77.59	43.80	53.42

Milk Collection

- VCS located within five to ten kms from villages collect milk from members farmers twice daily.
 - Traditional system – Manual and the process is susceptible to fraud both at the initial stage and at the time of payment
 - AMCS system – Computerized.
 - Payments to farmers on the basis of the fat content @ Rs 230-240 per kg for buffalo milk, both on the basis of fat and SNF contents with weightage 60:40 for the cow milk.
 - Collected milk shipped each morning and evening to chilling centres/BMC, from there to plants.

Conclusions

- Dairy sector in Punjab modeled on a cooperative system. to support and uplift stakeholders through facilitating milk collection, quality control, pricing, marketing, extension service, logistics and other subsidized support. The sector managed and succeeded in its objectives.
- Liberalization of the economy paved a way for the entry of private enterprises that increased competition for market-share through aggressive and integrated marketing initiatives; rapid economic growth, significant increases in the middle-income population and growth in demand for a wider variety & better quality products.

Conclusions Contd

- New entrants faced with procurement of fresh milk supplies that necessitated alliances with suppliers to ensure price competitiveness and continuity of supply. Most successful private sector companies adopted a model not unlike the cooperatives in their SCM.
- Punjab's dairy cooperative has responded to competitive pressures through pursuing SCM efficiencies that can be attributed to its good SCM practices. It integrates its operations in areas such as procurement of supplies, logistics, manufacturing, distribution and inventory management; collaborating with milk suppliers at the grass root level by adopting several short and long term measures to enhance milk yields, improve milk quality, control costs; improving returns from their joint enterprise.

