Research Paper

Supply chain management of milk in Patna dairy project (Bihar)

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ABSTRACT : In this study, an attempt has been made to study analysis of Procurement of raw milk for Patna Dairy project is done from the rural areas of five districts of Bihar through one channel only. Marketing of liquid milk is done in the town parts of the five districts of Bihar through two channels. Every producer has their own cattle and buffaloes. Jersey breed of cows are highest in number (52%) while in case of buffaloes, local breeds (72%) still wins the race. About 80 per cent of the producers purchase cattle feed, 'Sudhadaan' for their cattle, which is manufactured by PDP.Only 20 per cent of the producers have used artificial insemination provided by the PDP. Still only 33 per cent of the producers have attended the training programmes conducted by PDP.Only 10 per cent of the consumers are well aware of the toll free consumer's help line number.

KEY WORDS : Supply chain, Milk, Dairy

INTRODUCTION :

Concept and meaning :

A dairy is a facility for the extraction and processing of animal milk, mostly from buffalo or cows and also from goats, sheep for human consumption. It is a place where handling of milk and milk products is done and technology refers to the application of scientific knowledge for practical purposes. Dairy technology has been defined as the branch of dairy science, which deals with the processing of milk and the manufacture of milk products on an industrial scale (Lambert and Cooper, 2000). As an attributive, the word dairy refers to milk-based products, derivatives and processes and the animals and workers involved in their production for example dairy cattle, dairy goat. A dairy farm produces milk and a dairy factory processes it into a variety dairy products. These establishments constitute the dairy industry, a component of the food industry also it is a part of the livestock sector of the country.

Global scenario of milk production :

The table given below shows the milk production from cows in selected countries of the world. It is interesting to note that the volumes of cow milk production have increased.There are geographical areas with a good standard of living (EU-27, Oceania, North America) where production exceeds needed domestic demand, thus, offering a wide range of dairy products for exports (Parlor and Wang, 1994). There are other geographical areas that evidence shortage of milk and dairy products (Asia, Africa), compared to their population. But, there are

someother areas showing an important production (EU-27, South America) as compared to population.

MATERIALS AND METHODS :

This chapter will explain the methodology adopted to fulfill the objectives under the study. The study is mainly concerned with the procurement and distribution management of milk by Patna dairy project, factors influencing the milk consumption and behaviour of the consumer towards milk purchasing (Jean, 1999). Keeping these points in view, the research procedure is adopted to examine the above said aspects (Lal and Staeling, 1984).

Location of study :

This study has been done in the Bihar state at Patna Dairy Project, Patna which isone of the most reputed and established dairies in Bihar.

Sample design:

The study was taken to examine the backward and forward linkages of milk supply and for this purpose, the list of milk producers, collection societies, distributors and retailers were obtained from the office of PDP. Out of this list, 15 producers, 6 collection societies, 6 distributors, 21 retailers and 30 consumers were randomly selected from Nalanda, Vaishali and Patna districts of Bihar.

Data collection :

Data pertaining to the year 2009 have been collected with the help of especially designed and pretested questionnaires/ schedules. Questionnaires/ Schedules were made to study the behaviour and problems faced by producers, distributors and retailers and to get the consumer's perception with the help of both open end and close end type of questions.

Data analysis methods:

The collected data has been analyzed according to the objectives by using the tabular, graphical method with the help of percentage technique and SWOT analysis was employed to find out the strategies of PDP.

RESULTS AND DATA ANALYSIS :

Generally this section deals with the analysis of data concerned to the different aspects of the present study and presentation of results. The main objectives of the project were to study the supply chain management of milk from producers to the consumers and the consumer's perception towards the Sudha milk (Maloni and Benton, 2000). The focus has been given on identifying the problems faced by the producers, collection centres, distributors and retailers. Also, the promotional activities used to increase the production and marketing have been analyzed (Carson *et al.*, 1999). An attempt, therefore, in this section is to explain the results of the above said aspects in the discussion that follows.

Bihar state co-operative milk federation (COMFED):

A quiet revolution is sweeping Bihar which has otherwise dismal performance in other areas of co-operative sector. Bihar state milk co-operative federation (COMFED) is leading this revolution with zeal and skilful management. Around 4.50 lakh rural families associated with 8600 dairies co-operatives are not only supplementing their income but alsoearning a name for their state as second Anand (Gujarat).The COMFED, a co-operative organization is set up in 1983 for the welfare of milk producer farmers in Bihar. It prides itself on being a body of the farmers, by the farmers and for the farmers.The COMFED tries to fashion itself around Anand with three tier structures- all working in perfect co-ordination with each other (Himanshu *et al.*, 2012).

Table 1 : Existing distribution network of Patna dairy project							
Cities	Zones	Area	Population '000 lakhs	Distributors (No.)	Outlets (No.)	WDB (No.)	Population covered/outlet
Patna	18	Patna	20.00	12	1098	76	1821
Bihar Sharif	01	Town	2.75	01	22	09	8871
Hajipur	01	Town	1.5	01	45	03	3125
Sheikhpura	01	Town only	1.5	-	25	06	4838
Chhapra	01	Town only	2.0	01	34	04	5263
Total	22		27.75	15	1224	98	23, 918

At the primary level which actually is village level, Primary Dairies Co-operatives exist. At present there are 8600 PDCs in the whole state. Village level dairies co-operatives elect district Co-operative Unions which are presently six in number with head quarters at Patna, Muzaffarpur, Darbhanga, Barauni, Arrah and Bhagalpur. Two more are in the process of coming up. The different milk unions, which are organising the DCS network, are as follows:

– Vaishal Patliputra Milk Union, Patna, covering Patna, Vaishali, Nalanda, Sheikhpura and Saran districts.

– Dr. Rajendra Prasad Milk Union, Barauni, covering Begusarai, Khagaria, Lakhisarai and Saharsa districts.

– Tirhut Milk Union, Muzaffarpur, covering Muzaffarpur, Sitamarhi, Sheorhar, East Chhamparan, Siwan and Gopalganj.

– Mithila Milk Union, Samastipur, covering Samstipur, Darbhanga and Madhubani districts.

– Shahabad Milk Union, Ara, covering Bhojpur, Kaimur and Rohats districts.

– Bhagalpur Vikaramshila Milk Union, Bhagalpur, covering Bhagalpur, Munger, Katihar districts.

At the village level, dairy co-operatives have 13 members including a Chairman.The chairmen of Primary Dairy Co-operatives elect district Milk Union Board. These DMUB take care of the needs of Village Dairy Co-operatives and operate in tandem with them. At the state level, the COMFED is constituted by the chairmen of DMUB which are six in number. There are 11 members on the board of COMFED in which, 3 are from NDDB, Managing Director and the chairman being the other two.The COMFED has about 26 milk products and this is marketed under the brand name of 'Sudha'. On an average about 7.5 lakh litres of milk is procured every month with this figure touching 11 lakh litres in March 2010. It is being marketed in 110 cities even crossing the border of State to West Bengal, U.P. and Jharkhand. Amidst the dismal co-operative scenario in the state of Bihar the story of 'Sudha' is indeed inspiring. Most of the co-operatives be it consumer, land development bank, the once famous BISCOMAUN are defunct bodies today. But even for COMFED the journey is far from complete. 'Sudha' would be truly successful when the

Table 2 : Existing commission structure

Products	Distributor's commission (Rs. / lit.)	Retailer's commission (Rs. / lit.)	Consumer's price (Rs. /lit.)
Tonned milk (Healthy)	0.36 to 0.49	0.80	22
Double tonned milk (Smart)	0.36 to 0.49	0.80	20
Standardised milk (Shakti)	0.36 to 0.49	0.80	24
Full cream milk (Gold)	0.36 to 0.49	0.80	26
Cow milk	0.36 to 0.49	0.80	24

Table 3 : Milk sale of Patna dairy project average milk sale (litres/month)

Months	2005-06	2006-07	2007-08	2008-09	2009-10	% change over the base year
Apr.	103195	121903	147254	159199	148760	44.1
May	125157	126410	135793	138854	148254	18.4
Jun.	118226	126034	137660	137134	148588	25.6
Jul.	112909	124323	132587	156432	146570	29.8
Aug.	117433	127809	145910	138180	145370	23.7
Sept.	113245	126356	139622	143089	156411	38.1
Oct.	112894	127686	126256	144003	145729	29.0
Nov.	108602	122290	132355	140865	155563	43.2
Dec.	112365	129093	135027	153403	160818	43.1
Jan.	127162	151396	161980	172162	163674	28.7
Feb.	115875	135144	146277	152121	152368	31.4
Mar.	115592	129031	143498	145880	143661	24.0
Total	1382655	1547475	1684219	1781322	1815766	31.3
Yearly average	115221.3	128956.3	140351.6	148443.5	151313.8	31.3

entire state supports it with raising the milk production.

Forward linkage/ distribution system of Patna Dairy Project :

The distribution system of PDP is very wide. The milk of different kinds is distributed in the five districts of Bihar every day. These districts are Patna, Nalanda, Vaishali, Chhapra and Sheikhpura. PDP involves two channels of milk distribution in these five districts (Rajiv and Schul, 1992).

The channels used by Patna dairy project are:
Industry:
–Distributors - Retailers (Milk Parlors and Shops) – Consumers

This type of channel serves two purposes,

– It helps those consumers who use to buy milk either from the shops or the milkparlors by themselves.

– It also serves the purpose of free home delivery. In FHD, the retailers use to deliver the required amount of milk at the consumer's door step. For this, the consumers have to pay in advance to the retailers but there is no extra charge for this and the organization itself pays Rs. 0.40/ lit. extra to the retailers for this. FHD helps to maintain regular relationship with the consumers.

Industry-consumers :

This is called as direct Sale. Through this, the industry use to deliver milk directly to the consumers in different institutions, Army cantonment, Jails, Secretariat, Hotels and Restaurants. For this purpose, industry uses the vehicle of distributors and duly pays them for this.

Patna being the main market of Patna dairy project has the highest number of zones and distributors, covering entire Patna with highest number of outlets but population per outlet is highest for Biharsharif. Biharsharif, Hajipur and Chhapra have only one distributor while Sheikhpura has none. The milk is transported to Sheikhpura by the distributors of Patna (Towill *et al.,* 1992).

Order process of milk:

Milk is one of the most perishable vegetarian products and it can't be stored as like other product, so the industry first takes order from the distributors every day, who gets it from the retailers every evening and then process that much amount of milk only. As soon as the distribution department gets order from the distributor,

they pass that to the processing department to process that amount of milk. After processing, milk is packed and stored in the cold storage for dispatch.

Retailers→Distributors→Distribution department →Processing department.

Commission structure of distributors and retailers:

The commission of the distributors and retailers is fixed by the industry itself. The commission of distributors varies from Rs. 0.36 to 0.49 per litre on every kind of milk while that of the retailers is Rs. 0.80 per litre on every type of milk. The commission of the distributors depends on the distance of transportation. The longer will be the route, the higher will be the commission. The shortest route is paid with Rs. 0.36/ litre and the longest route is paid with Rs. 0.49/ litre on every kind of milk.

The full cream milk (Gold) is the highest priced milk of PDP. Cow milk and Shakti (Standardised) are available at the same price followed by Healthy, the toned one. Smart (Double tonned) is the lowest priced milk of PDP.

Conclusion:

Sudha, because of its brand name has monopoly over the entire Bihar state. Still, only two private dairies have tried to endeavour in the Patna city but they are very far from their target.

Besides Sudha, the population of Bihar mostly go for Khataal/ loose milk. The capacity of chilling plants of PDP is less than the milk collected from that area. The producers prefer to feed their cattle with Sudhadaan (cattle feed), manufactured by PDP as it is nutritious, tasty and available at lower price than the others, like Kapilapashu Aaharetc Most of the producers are not aware of the Artificial insemination provided by PDP at the collection centres. Mostly the progressive producers are given the chance to attend the trainings organized either by PDP or the State Government and the small producers are not given due concern. The distribution system is not target oriented. The retailers are not given due consideration and their main problem of leakage is not solved. There are no regular meetings of distributors and retailers with the management and is taken when needed.

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