Effectiveness of Supply Chain Management with reference to Dairy Products in Dakshina Kannada -A Case Study of Dakshina Kannada Cooperative Milk Producer's Union Limited.

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ABSTRACT

Our country has a rich tradition in dairying since the time of Lord Krishna. Dairying has been inherent and non separable in Indian culture, for centuries. Milk and milk products have always been an integral part of our consumption habits. India continued to be the largest milk and its product producing nation in 2013-14 with an anticipated milk production of 137.6 million tonnes. The country's share in world milk production stands at 18 per cent. According to pre-budget Economic survey 2013-2014,India recorded peak production of milk at 132.43 million tonnes (MT) in 2012-13, becoming the top milk producer globally, the pre-budget Economic Survey said today.

Keywords: Backward and Forward integration of SCM, DKMUL, Distribution, Pre-budget, MT.

I. Introduction:

Supply Chain Management (SCM) is the process of planning, implementing and controlling the operations of the supply chain with the purpose to satisfy customer requirements as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work-in-process inventory and finished goods from point-of-origin to point-of-consumption. The term supply chain management was coined by consultant Keith Oliver, of strategy consulting firm Booz Allen Hamilton in 1982.

Our country has a rich tradition in dairying since the time of Lord Krishna. Dairying has been inherent and non separable in Indian culture, for centuries. Milk and milk products have always been an integral part of our consumption habits. India continued to be the largest milk and its products producing nation in 2013-14 with an anticipated milk production of 137.6 million tonnes. The country's share in world milk production stands at 18 per cent. According to pre-budget Economic survey 2013-2014, India recorded peak production of milk at 132.43 million tonnes (MT) in 2012-13, becoming the top milk producer globally. Milk production

in the year 2011-12 was 127.9 MT, according to the National Dairy Development Board (NDDB) data. "The average year-on-year growth rate of milk at 4.04 per cent vis-a-vis the world average of 2.2 per cent shows sustained growth in availability of milk and milk products for the growing population," the survey said.

Karnataka stands eleventh in milk production in the country and it occupies third position with respect to milk production under co-operative sector in the country. Karnataka Milk production across India has grown at a significant rate of about 19 per cent, with overall milk production crossing the 121-MT mark as of 2010-11. The milk production was around 4124 thousand tones during the year 2010-11. The KMF is covering 30 districts, with 9000 dairy co-operative societies, around 25000 villages involving 1.5 million farmers collecting around 20 lakh liters of milk daily.

The Indian supply chain for milk products is affected by abnormal wastage and poor handling. The wastage occurs because of multiple points of handling. Keeping in view all these facts; an attempt is being made to assess the management of dairy processing units in Karnataka.

II. Dakshina Kannada Co-operative Milk Producer's Union Limited:

It is a ISO 22000:2005 certified organization having jurisdiction of D K and Udupi coastal districts. It is one of the leading milk unions in the state of Karnataka. At the time of registration during the year 1986, the Union's milk procurement was 4500 KPD. Now the union is procuring 335742 KPD through 671 Dairy Co-operative Societies. In the beginning, Union was procuring 80% of its requirement of milk from neighboring/ other milk unions of KMF and now the union is at threshold of becoming self reliant by increasing local milk procurement. Union has 671 functioning Dairy Co-op, Societies. The Union has established 179 women Dairy Co-op. Societies in its jurisdiction, out of which 154 WDCS are under STEP Programme of Government of India. The MPCS are having 119774 farmer members out of which 33290 are women members.

Processing facilities		
Mangalore Dairy	Manipal Dairy	Puttur Chilling Centre
250000 LPD	80000 LPD	20000LPD

III. Literature Review:

In this chapter, an attempt has been made to critically review the literature of the past research work, in relevance to the present study. Except a few, most of the studies were confined to the milk processing and distribution. However, the studies conducted on milk processing and other related agricultural commodities were reviewed and presented under the following heads.

Veena and Tajinder (2000) has studied performance analysis of Bhogpur and Jargoan sugar mills in Punjab. The procurement pattern of these two sugar mills, the Jargon mill crushed 2238.67 thousand tonnes of sugarcane and produced 191.93 thousand tonnes of sugar. Thus, the quantity of cane crushed and production of sugar were higher for Jargoan mill compared to the Bhojpuri sugar mill. The quantity of cane crushed and the quantum of sugar production was higher by the Jargon mill by 38 and 35 per cent, respectively. The percentage recovery of sugar for Jargoan mill was 8.38 being lower compared with 8.57 for the Bhogpur sugar mill.

Lindgreen and Hingley (2003) discussed the measures taken by Tesco Food Company in setting up effective guidelines for managing its relationships with neat suppliers. These guidelines make it possible for serious food scares and to address consumers concern over animal welfare and environmental issues. Specific initiatives include different animals, feeds and medicinal policies and schemes have been implemented by both Tesco and the meat suppliers. The benefits of Tesco's approach to its suppliers and consumers are considered and included the ability to deliver higher value products.

Narayana Reddy (2004) in his study reported that most (61%) of the retailers get their requirements from wholesalers, 15 per cent from the large and other retailers. Over 17 percent of the selected retailers get their goods from more than one source, but a small percentage of retailers get some of their requirements from producers.

From the side of the terms of supply 67 per cent of retailers get their requirements by paying cash. Only 13 percent of the retailers get their requirements on credit and 19 per cent get credit partly from the suppliers. Apart from this, the study also shows that the organized retailers/hyper malls and super marketers get wholesales' margin plus concession as they buy in bulk and are also the producers.

Nityanand Singh & Dr. Prachee Javadekar (2011) The objective of their study is to examine the use of IT enables services, level of education and linkage of professional knowledge among the retailers for supply chain management in order to enhance profitability, providing more value to consumer and producer by reducing wastage.

IV. Objectives of the study:

The main objectives in this research are:

- To study the impact of distribution System of Milk and Milk related Products at D.K.M.U.L.
- To study the effectiveness of distribution system of D.K.M.U.L.
- To study the impact of Information Technology on existing distribution system of the finished goods.
- To study the overall system of SCM at D.K.M.U.L.

Co-operatives business (Backward)

DCS functional	671
Women Dairy Co-op Societies	179
STEP WCS	137
DCS having BMCs	72
DCS having AMCUs	501
DCS having EMTs	626
Members	119774
Active Members	55497
Women Members	33290
% age of Active Members	46.3%

1. Procurement of milk(Backward Integration)

1. Collection of milk.
2. Processing of milk.
3. Production of milk products.

D.K Milk Union is engaged in collecting and processing and distribution of milk and milk products in D.K and Udupi districts. **Average procurement per day in Kgs(335742)**

Collection of milk from chilling centers:

Chilling centers are attached to dairies. The chilling centers at Puttur and Manipal are also supplying the collected milk to the dairy for processing purposes. Portion of milk is processed and packed at Manipal dairy.

Advances of collecting milk from the co-operative societies:

1. To preserve the quality of raw milk supplies from dairy co-operatives.
2. To facilitate easy transportation of milk to the processing dairy.

Receiving of milk:

Milk is delivered to the dairy in cans and tankers. The can are unloaded manually on to the chain conveyor and the milk is inspected. First, the milk will be graded and tested.

Grading:

This refers to the classification of milk on the basis of quality. This is gone by organleptic tests such as smell, taste, appearance and touch.

Smelling of milk:

The cover of each can is removed, inverted and raised to the nose mix; the milk is thoroughly by using the plunger and smells the milk. An experienced milk grader with a trained nose can make a decision whether to accept or reject the milk.

Appearance:

By observing the milk in each can appearance test will be made. Any floating extraneous matter, off color, or partially churned milk will be noted. By these tests the milk will be graded. After this test cans with milk is allowed to reach the reception point and milk is poured in to the weighing bowl them can and lids passed on to a car washes-via. A drip saver or drum rack. The milk is discharged in to a dump tank placed immediately below the weigh bowl. Milk is pumped to a raw milk storage tank through the chiller. The milk is being received from milk chilling centre, which has already been graded, weighed, sampled and cooled. It is weighed, sampled and received.

Filtration/Classification:

The milk is then pumped through a filter to storage tank.

Cooling and storage of raw milk:

Pumping through plate chiller and stored in insulated tank chills the filter/classified milk to 0.5^0 C below. There are three tanks of 40000 and 30000 liters capacity and one tank is 15000 liter and one tank is 5000 liters capacity.

Standardization:

It refers to the adjustment of the fat and solids-not fat. The average fat and SNF content of incoming milk is 4.5 and 8.5 respectively. Excess of fat than 3% is removed in the form of cream. It is used for the production of other milk products.

Pasteurization:

It refers to the process of heating every partial of milk to at least 72^0 C for 15 seconds and immediately cooled to 4^0 C or below.

Homogenization (500/2500-PS):

Homogenization is a process by which the fact globules are subject to high pressure treatment to obtain smaller globules with uniform distribution and non-separation of fat during long storage of milk.

Packing:

After all these steps are followed the Pasteurizes milk with the help of form fill seal (F.F.S) machine as to serve the dual purpose. Packed milk is preferably a store at 5^0 C or less till the milk is delivered. Dairy packs 225,000 liters of milk per day, 75% of milk are packed in ½ liters and remaining 40% of milk is packed in 1 liters.

The pasteurized milk is packed as to serve the dual purpose.

1. Protecting the milk against contamination, loss damage or adulteration.
2. Helping in the sale and distribution of the milk to reach the people. Milk is packed in 500ml and 1000ml sachets.

Pricing:

Price of products means amount of money for which a product can be exchanged, it is the money value of product. In DKMUL cost based pricing is being up followed by while determining the price. In case of milk they consider all the cost of procurement, selling, expenses, transportation expenses & profit margins etc and then the selling price per liter of milk is determined. In case of milk products like called ghee, peda, etc price is determined after considering all cost included by the firm. The main pricing objectives are is to increase in sales of milk products and also to increase & maintain market share. To meet the competition & customer satisfaction is also the main objectives.

Storage:

Packed milk is stored in cold storage at 5^0 C or less till milk is loaded into the trucks and then it is distributed to milk agents.

2. DISTRIBUTION CHANNELS OF THE DAIRY (Forward Integration):

As observed in our daily life we find very consumers MU are largely spread out in different areas of DK and Udupi districts. Actually the supply chain management plays an important role in the distribution channels. **No of active Dealers (1397), Parlours (18), Franchises (10).**

1. Dairy → Transport → Dealers → Retailers → Customers
2. Dairy → Transport → Parlour → Customers
3. Dairy → Transport → Dealers → Customers
4. Dairy → Transport → Hotels → Customers
5. Dairy → Customers.

Channels of distribution:

There are number of distribution channels under DKMUL.

- **Dealers (outsiders):**
  1. They will give bank securities as guarantee.
  2. Security deposit in terms of cash would be put as guarantee.
  3. Organization can make use of the good, local contact by authorized dealers.

4. The company will encounter less sundry debtors, as there is no problem of payment collection.
5. Less correspondence can enrich the growth of market with authorized agents.
6. Fewer sales forces are employed, since dealers are themselves skilled in setting activities.

Under the dealers there are 3 types. They are as follows:

a) Houses
b) Shops
c) Parlour

V. Research Methodology:

This research paper is the consolidated of both primary and Secondary data. Primary data is collected from 50 authorized dealers of Puttur and Belthangady city between age group of 18-46 and above years through questionnaires and Secondary data was collected through internet, journals and business magazines. This survey study was conducted in April, 2015. A total usable sample of 50 respondents was taken, out of which 30 were taken from respondents who are authorized dealers and rest 20 respondents who are in private job along with dealership.

VI. Hypothesis:

The following hypotheses are framed to attain the above mentioned objectives.

Ho: - There is a significant relationship between getting milks in clean crates and overall ratings of supply chain management of DKMUL.

Results and analysis

The data collected by administering the structured questionnaire is tabulated in this chapter. Tabulated data is analyzed through percentage and the hypothesis is tested through Chi square Test.

Chi-square test

Chi-square is an inferential statistical method, ideally suitable in case of before and after instance in the data. Decisions are based on comparing the calculated value and table.

If the calculated value is greater than the table value rejects the hypothesis.

If the calculated value is less than the table value accepts the hypothesis.

The X^2 values are computed by using the following formula

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where

O-Observed frequency

E-Expected frequency

X^2-Chi Square test

Ei-Row total

Cj- Colum total

Rj- Row total

Significance level is 0.005 degree of freedom at (C-1)*(R-1)

Where-C= Colum, R= Row

Results are derived through chi-square Test on hypothesis which is drawn on the basis of objective of the study.

Table: 9 Acquiring milk in clean crates.

Table: 16 Overall ratings of SCM of DKMUL.

Milk in crates / Overall rating of SCM	Yes	No	Total
Best	15	4	19
Better	19	4	23
Good	6	2	8
Poor	0	0	0
Total	40	10	50

O	E	O-E	(O-E)2	$\frac{(O-E)2}{E}$
15	15.2	-0.2	0.04	0.0026
19	18.4	0.6	0.36	0.0195
6	6.4	-0.4	0.16	0.0250
0	0	0	0	0
4	3.8	0.2	0.04	0.0105
4	4.6	-0.6	0.36	0.0783
2	1.6	0.4	0.16	0.1000
0	0	0	0.00	0
	$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$			0.2359

Degree of Freedom

V= (r-1)*(c-1)

V= (4-1)*(2-1)

V= 3*1

V = 3

For V=3 X^{2}=0.05

Table value=7.815

Calculated Value =0.2359

X^{2} (cal) < X^{2} (tab)

From the above statistical analysis it can be inferred that the table value (7.815) is more than the calculated value (0.2359), from its clear that the hypothesis Ho is accepted. Hence, it can be concluded that there is a significant relationship between getting milks in clean crates and overall ratings of supply chain management of DKMUL.

VII. Findings:

Based on the study undertaken it is observed that:

- ✓ From the survey, it is found that the supply is always met of Nandini milk and related products at a convenient time to the dealers.
- ✓ From the analysis and interpretation it is found that main focus of Nandini milk for its quality, customer demand and brand image.
- ✓ Nandini milk and its product reach every level of customers because of its brand loyalty.
- ✓ Majority of the dealers are high achievers along with high discipline and performing well.
- ✓ Maintaining of brand image by continuous innovation and invention.

VIII. Suggestions:

From the study following suggestions are made.

- ✓ It has been observed during the course of the study that dealers expected some more information regarding the new products. So the company should give more explanation regarding the new things.
- ✓ The company should conduct a meeting for the entire employee to deliver the methods for the effective distribution.
- ✓ The company should conducts survey on its products by meeting their retailers and also collecting opinions about the milk & milk products. The retailers who have lack of confidence should train. This will give encouragement in performing their and motivate them to perform better.
- ✓ The company should make the retailers to know their key results area very clearly.

IX. Conclusion:

The success of DKMUL is fully depends upon effective Supply Chain Management. It includes dairy, transporters, dealers, retailers and finally consumers. The Supply Chain Management plays a vital role in the marketing of milk & milk products from the DKMUL. The company having an effective distribution network which helps successful marketing of the products. By these effective distribution networks it helps to meet the customer needs, wants and expectation in a right time, in a right place and also in a right manner. So, we can

conclude that effective Supply Chain Management is the key to the success for marketing the products.

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