Evaluating Value Chain & Retailing of Milk in Chittoor, Andhra Pradesh*

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Abstract

The main objective of the study was to carry out dairy value chain analysis of milk in chittoor district and environs with a view to identify potential production, key sector constraints and opportunities and appropriate interventions. The observation of the report is based on complete enumeration of all the households of Kommireddy gari palli village, selected following stratified random sampling procedure. The village has been selected on the basis of village level milk production. There are two distinct market channels. The informal/warm milk market channel which account 30% and the formal/cold milk channel accounting for the remaining about 70% of the milk market in the area. Smallholder farmers only sell morning milk (about 70%) through the formal/cold milk market channel at prices ranging from Rs.40 to Rs. 45 per liter. The balance (30%), mainly comprising evening milk is commonly sold informally in local markets at prices ranging from Rs. 35 to Rs.40 per liter (largely due to lack of coolers). Some of the medium-large milk buying organizations such as Kisan Raithu Mitra Sangam /Milk Producers Association (MPA) undertake integrated functions within the milk value chain and also offer embedded services including in-kind input credit and limited extension services. These buyers pay for milk fortnightly or in some cases monthly. In addition, there is also a large (but unknown) number of independent traders who buy milk on cash basis (Rs. 30 to 40 per liter) and sell mainly to retailers and household consumers such as Balaji, Heritage at prices ranging from Rs. 34 to 45 per liter.

Keywords: *Milk, Value Chain, Retail, Market Channels, Livestock, Consumer*

Introduction

In India, the dairy sector is important for various reasons. Among these it's complementarily with agriculture for example and a capability to enrich the protein diet of the vegetarian population is well documented. A contribution, which is not well recognized, is its role in balancing the rural inequity. In recent decades the dairy sector has emerged as an important source of rural employment and income in the country.

A restrictive trade policy for milk products and the emergence of Amul type cooperatives has changed dairy farming practices in the country. Farmers have started receiving a favourable price for their milk, and the milk production system, which was essentially a self-contained one, is now being transformed into a commercial proposition. The crossbred technology has further augmented the viability of the dairy units by increasing the milk production per animal. Subsequently milk production has increased at an exponential rate while the benefits of an increase in milk production also reached the consumers as is apparent from a relatively lower increase in the price of milk. Unlike in advanced western countries where milk handled by the organized sector or milk delivered to the dairies account for over 90 % of production, in India, milk collection in organized sector is around 18 % of total production. Two components that directly affect milk deliveries are retention for family consumption and conversion into ethnic milk products. Sometimes, due to absence of reliable market access, the producers manufacture milk products by default. Presence or absence of village cooperatives could also influence the degree and magnitude of milk conversion. It is possible that such manufacturing is more rewarding than opportunity cost of selling raw milk. If that were the case, sell of milk by the producers and therefore milk collection in the organized channel would always be less than its potential. Probably, the incidence of family

manufacturing of milk products might be good enough a reason, which could lead to sub- optional milk deliveries in the organized channels.
From the point of view of economic rationale the justifications for conversion of milk into products could be superior returns, good market, improved market channels and possibly, advance procurement arrangements. It could be possible that due to good demand in the terminal/ referral/ wholesale/ retail market these products have matured into a well organized trade. Some could also argue these phenomena from the angle of age old traditional practices passed through generations.

Public Private Partnership (PPP) mode of Retailing Special Markets:

While most schemes initiated too far in agricultural marketing were focused on field crops, fruits and vegetables, it is important that the livestock, poultry, fish, medical plants etc. are also taken care of as these products contribute a sizeable portion to the agricultural Gross Domestic Product (GDP) of the country. These special markets are conducted under PPP mode of development. PPP will be more appropriate for developing new markets for dairy, poultry and meat products. Promotion of Hazard analysis and Critical Control Point (HACCP) system, code of practices on good animal feed, good hygienic practices and good manufacturing practices may require participation of both public and private sector efforts to achieve better results. Statistics show that there are 1300 livestock markets in 11 States. These markets suffer from dearth of amenities and experience a high incidence of market charges. The markets are primitive and plagued by lack of weigh bridges, ramp facilities and separate markets for different species; in transparent transactions dominated by unlicensed brokers and merchants, undue market margins and lack of veterinary support.

Highlights of the Milk Industry in the study area:

Based on the interviews and observations by the study team, the following are the key highlights of the dairy value chain in the study area

1. Despite problems of occasional and persistent drought in recent years, the study area has significant potential for milk production.
2. There is still competition in the milk business between processors and traders with the latter mainly selling to the farmer during glut periods (otherwise selling mainly to consumers during times of scarcity).
3. Smallholder farmers account for over 58% of total milk produced in the area with the remaining 38% semi and medium size farmers and the remaining 4% coming from a few large farmers in Chittor district, notably Kommireddy gari palli village.
4. Over 85% of the smallholder farmers practice open pasture feeding system despite the declining size of household land holding.
5. The area has many types of players in the areas of bulking and marketing (from large corporate organizations, milk producers cooperative societies and Brookside to small independent traders).

Objectives of the study:

1. From producer to consumer to understand the different – middle – operations in the marketing.
2. Value chain mapped from farmer to end – consumer.
3. To understand the constraints to eliminate the middlemen to benefit farmer and consumer.
4. To understand the market potential of particular commodity and value added products of that commodity.
5. To understand the opportunities to make value added product of particular commodity for Govt. and Pvt. Organizations.
6. To understand the market potentiality of the particular commodity and value added products.

Study Area:

The present study was taken up in Chittoor district of Andhra Pradesh. In view of highest volume of milk production and due to larger marketing activity taking place in Chittoor district Nimmanapalli, mandal, Kommireddy gari palli village with a sample of 24 farmers were randomly selected endowed with relatively highest milk production area. Hence Chittoor district is very much preferred for the present study.

Study Methodology and approach

Field interviews in and around the study area with respondents being drawn from a wide range of

stakeholders including but not limited to smallholders including but not limited to smallholder dairy farmers, cooperative societies, processors, local administration, traders, local NGOs and transporters among others.

Collection of data:

The data used in the study to fulfil various objectives were collected with the help of well structured pre tested interview schedules, through survey method for the agricultural year 2011-12. Participatory techniques and Focused Group Meetings were conducted to track the value chain in the selected region.

Statistical Tools and Techniques:

Milk Procurement Cost

Cost of operations per liter of milk = Total cost involved in respective operations /Total quantity of milk handled for that operation

Marketing Cost

The total cost incurred on marketing by producer- seller and by the various intermediaries involved in the sale and purchase of the commodity till the commodity reaches the ultimate consumer was taken under this head (Acharya and Agarwal, 2006).

$C = Cf + Cm1 + Cm2 + Cm3 + \ldots\ldots\ldots\ldots\ldots\ldots Cm\ i$

Where,

C = Total cost of marketing of the commodity,

Cf = Cost incurred by the producer from the time the product leaves the dairy plant, and

$Cm\ i$ = Cost incurred by the i middleman in the process of buying and selling the product.

Constraints perceived by the farmers:

Garrett's Ranking Technique

Percent position = 100 (Rij - 0.50) / Nij

Where, Rij is the rank given by ith item by jth individual

Nj is the number of items ranked by the jth individual

(Note: The percent position of each rank is converted into scores by referring tables given by Garrett and Woodworth (1969). Then for each factor, the scores of individual respondents are added together and divided by the number of respondents for whom scores are added. The mean scores for all the factors are ranked by arranging in descending order).

Milk and Milk Products Value Chain:

A value chain describes the full range of activities required to bring a product from conception to its end use and beyond. This includes activities such as design, production, marketing, distribution and support to the final consumer (Ruijter de Wildt, Elliott, & Hitchins, 2006). The value chain of the milk and milk products of in Kommireddy gari palli village, Chittoor district, Andhra Pradesh involves six distinct value adding activities from the production of the milk through reaching to the final consumer in the market. These activities include input supply; production; gathering (bulking); processing; transportation; and retail trading.

Livestock productivity

The productivity of H.F milch animals was 17.6 l/day in the first 3 months after lactation with relatively higher milk yield in the case of cows (12.71 l/day) .

Table 1. Productivity of milch animals in Kommireddy gari palli village (in lts/day)

Species	Stage of lactation		
	First 3 months	4-6 months	After 6 months
Cows	17.61	14.56	10.32
Buffaloes (Murrah)	12.28	9.81	6.47

Cost of maintenance of animals during lactation period

The data in Table 2 revealed that the total costs incurred on maintenance of animals is Rs. 20767 per animal of which Cost of concentrates during lactation period accounted to Rs.10596 (41.12%) followed by green fodder Rs.5097 (19.78%), dry feed Rs. 3614 (14.02%). The major expenditure share of variable costs includes Cost of concentrates during lactation period occupied a lion's share 41.12% of the total costs.

Table 2. Average cost of maintenance of Animals (Rs/per animal) during lactation period

Particulars	Cows improved	Percentage (%)
Cost of dry feed during lactation period	3613.75	14.02
Cost of green fodder during lactation period	5097	19.78
Cost of concentrates during lactation period	10596	41.12
Medicines	293	1.14

Health expenses (fee)	208	0.81
Insurance	1792	6.95
Others	4169	16.18
Total	25767	100

Average cost of maintenance of animals during dry period

The data in Table 3 revealed that the total costs incurred on maintenance of animals is Rs. 14848 per animal of which, major share was on Concentrates (27%), Green fodder (25%) and feed (19%) in the study area.

Table 3. Average cost of maintenance of Animals (Rs/per animal) during dry period

Particulars	Cows improved	Per cent (%)
Dry feed	2858	19.25
Green Fodder	3681	24.79
Concentrates	4005	26.97
Medicines	210	1.41
Health expenses	154	1.04
Insurance	1367	9.21
Others including labour charges	2573	17.33
Total	14848	100

Milk production details (Per Annum)

It must be recognized that this particular Kommireddy gari palli village, Chitttoor district offers considerable scope for further research into social dimension of milk production, sale to the dairy cooperatives, community based patronage, proximity to urban centers and occupational diversification of the villagers. The HF animals were the most preferred breed in the study area because of its higher yields and length of lactation. In the informal discussions as well as in the FGD the major issues that cropped up are: low conception rate, infertility, repeat breeders and higher level of exotic inheritance beyond 85% blood level in HF animals. Usually the milk producers in the selected village are retaining young female animals while disposing the male ones within a year. As per the study HF cow Kommireddy gari palli village, Chitttoor district at rates in the range of Rs.35,000-50,000 for an animal. The milk production details are presented in Table 4.

Table 4. Milk production details (Per Annum) in Kommireddy gari palli

Particulars	Cows improved
Total milch animals in the study area	93
No. of milch animals@93/24	3.88
Quantity of milk yield average /day /animal (liters)	12.71
Average no. of lactation days for all animals	211 days
Qty. of milk consumed in Ltr/day	0.79
Total Qty. of milk per day (liters) (12.71*3.88)	49.31
Marketable surplus / household	48.52
Milk collection – Qty Marketed surplus (l)	48.52
Weighted average price per liter (Rs.)	20.18
Total amount/household/day (Rs.)	979.23
Gross income /animal/day (Rs.)	252.38
Gross income /animal/year	92118.33
Cost of maintenance/animal/year	40615

Land ownership of the dairy animal owning households is limited as the majority of the sample small and medium farmers moreover educationally they are back ward and have studied up to secondary level only. In absence of alternative avenues of livelihood, farmers opinioned that dairying is a profitable proposition ensuring regular cash flow in the family budget with the profit of around Rs.50,000 per annum on each cow excluding fixed costs and imputed family labour.

Functioning and Marketing System of Commodity Interest Group (GIG)

All the 24 households in gari palli village formed in to one Commodity Interest Group called Kisan Rythu Mitra Sangham (KRMS) this was registered in 2003 and it was reported that milk producers are very happy to receiving good financial support and also getting correct payment with in time period i.e., once in a fortnight. Hence in the study area private milk organizations are playing major role like Heritage. The milk rate is uniform not fixed based on the milk lactation, fat, SNF%. It is observed that all the dairy producers have satisfied with the rate offered by Heritage as it is remunerative keeping the cost of production in view. Further, it is to be noted in the selected village, private dairy firm is supplying feed on 30% subsidy basis besides conducting health camps. Hence there is only one marketing channel existing in the study area i.e., Producer – Heritage dairy – Retailer - Consumer.

Table 5. Value addition to dairy products of cooperative and private dairy plant (per liter or kg)

Dairy Product	Co-operative dairy plant		Private dairy plant	
	Value Added (Rs.)	Per cent (%)	Value Added (Rs.)	Per cent (%)
Toned milk	5.26	31.88	5.54	31.66
Standardized milk	6.99	33.29	6.63	30.14
Full cream milk	6.92	31.45	6.46	27.49
Butter	52.97	32.10	61.06	35.92
Ghee	84.78	40.37	81.63	39.82
SMP	71.37	41.98	59.28	36.37
Khoa	85.50	47.50	-	-
Milk peda	75.07	65.28	-	-
Ice cream	-	-	61.38	55.80
Mysore pa	-	-	76.44	44.44

Source: A.P Dairy Development Cooperative Federation

Value Added Milk Products from Govt. & Private Organizations

The value addition to dairy products as per the above table 5 depicts that in the co-operative dairy plant the top three earners in terms of value addition were: milk peda (65.28%), khoa (47.50%) and skimmed milk powder (41.98%). All the dairy products had added more than 30 per cent of value after passing through the value chain. In money terms, it varied from Rs 5.26 in toned milk to Rs 85.50 in khoa. Full cream milk's contribution to the value addition was least among the co-operative dairy products.

In the private dairy plant, ice cream (55.80%), Mysorepa (44.44%) and ghee (39.82%) secured the top three ranks in terms of value addition. Except full cream milk (27.49%), all other dairy products had added more than 30 per cent of the value to the product. In terms of money, the value addition ranged from Rs 5.54 in toned milk to Rs.81.63 in ghee.

Constraints faced by the milk producers

The information pertaining to producers towards logically identified constraint are analyzed for their normal and garret ranking and analyzed. Milk producers reception to rank them as per garrets ranking. The milk producers perception indicated that Providing chilling/cooling center was main constraint followed by Infrastructure facilities for milk procurement collection center require.

Thus constraints facing the smallholders' dairy sector at the production level in the study area include:

1. Low milk yield due to predominance of cross breed type of dairy animals among local farmers, poor feeding and lack of knowledge on disease management despite the potential to boost yield by over 2 and half times from an average of 6.5 liters to 20 liters per day per cow even without charging in current breed in Kommireddy gari palli.

1. High cost of Holstein Friesian and clinical services, lack of professionalism transparency on the type semen being offered and poor quality of service on the part of service providers and in-breeding practices have been a major underlying factor towards the predominance of low yielding cross breed cattle herd in the study area.

2. Lack of requisite skills and knowledge regarding silage feed conservation and management resulting in low feeding rates during dry periods;

Observations and Suggestions

The aim is to achieving its objectives of increasing milk production and income/employment in the selected area through:

1. Creation of adequate infrastructure for milk procurement, processing and preservation, thereby raising the local demand for milk substantially;
2. Assuring farmers of a market for their marketable surplus of milk at reasonable prices;
3. Providing technical, financial and extension support to farmers for raising milk production;
4. It is suggested while creating value from the products manufactured in important, without a regulatory mechanism such a value will be self defeating.

Extension Activities:

Required for carrying out dissemination of improve dairy technologies; bringing-in effective public-private partnership for transfer of dairy technologies in the areas *viz*, knowledge and capacity building milk producers, participatory technology assessment and refinement, organizing self-help groups for management marketing and use of effective information and communication technologies (ICTs) for faster dissemination of information pertaining to improved technologies, storage, processing, marketing and procurement etc; generation and replication of success stories under real farm situations and use of mass media *viz*, video programmes, print media, radio or television for popularizing these success stories, instead of the technologies alone; importance for dairy

system disseminating improved technological packages instead of distributing subsidies; There is a need for paradigm shift in public sector transfer of technology from top-down, blanket dissemination of technologies towards facilitating learning and understanding.

Policy Reforms:

In most of the cases low milk productivity is due to inefficient system of provision of different inputs and/or services such as feeds and fodder, animal health care facilities, artificial insemination, which requires institutional reforms to make delivery/extension system more effective. The role of government, private sector, farmers' organizations, local bodies, NGOs, etc. needs to be re-defined in the light of new economic environment and make delivery of inputs and services more effective and efficient. The food safety, hygiene and quality issues need to be addressed through appropriate policy mechanism to ensure the consumers get safe milk and milk products.

Conclusion:

Milk production in Kommireddy gari palli village, Chittoor has shown remarkable growth, but the potential role of dairy farming as a tool to increase household incomes, create rural employment and increase the regional competitiveness at producing milk are still to be realized. Improving the performance on the milk and dairy products' chain are: high potential of pasture and fields in Chittoor, Andhra Pradesh, increasing level of milk and dairy consumption, numerous potential consumers, increasing level of cereals' consumption on breakfast, consumers' preferences for healthy foods, like milk, and yogurt, high level of quotas negotiate for which the farmers will receive subsidies, increasing productivity.

The strengths of the chain consist in increasing number of investments in milk processing factories, and hypermarkets which enable consumers to choose from a large variety of dairy products of high quality, and low prices. In transition period the reforms and restructuring processes affected agro-food system performance. Land propriety high fragmentation, low yields, lack of mechanization, low level of investments, small batches of agricultural products delivered to processing industry, small quantities of outputs entered on the channels of the chain, high level of self-consumption, and high fragmentation of distribution's system are some of the weaknesses of the milk and dairy products' chain.

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