
Pradesh Milk Federation[®]

"Why can't we lower the purchase price or buy less milk in the peak season rather than deal with all that surplus?" Mr. Mohan Kumar, 50, the newly appointed Managing Director asked the managers of the Pradesh State Co-operative Milk Producer's Federation Limited (PMF), a co-operative apex body of 5000 village level dairy co-operative societies (DCS), organised into 10 district level milk unions in the state of Pradesh, India. "We can't do that - the very reason the village co-operative exists is to provide the farmer a remunerative price and an assured outlet for his/her entire milk production throughout the year - we must accept every drop of milk the farmer decides to sell," said Mr. Pradeep Kanga, Manager (Procurement) dramatically.

"But surely not at the cost of ruining the dairy federation," said Mr. Mohan Kumar, glancing at the over Rs.1.5 crore losses shown in the profitability statement of the PMF for the year ending March 2001 and the projected loss of Rs.5 crores for the year ending March 2002 (see Table 1, 2 and 3).

It was early July 2001. Mr. Mohan Kumar's first internal meeting with his managers, after his sudden appointment as Managing Director of PMF, was in progress in the boardroom of the PMF at the state capital Raajpur. He had requested his managers to brief him about their respective activities. As the meeting progressed, Mr. Mohan Kumar, renowned as a turn-around expert in the Indian private sector, slowly realised that he was facing the greatest challenge of his illustrious managerial career. "There just aren't enough degrees of freedom to operate effectively out here," he thought to himself.

Mr. Mohan Kumar had been surprised at the offer made by a ministerial search committee of Pradesh State to head the PMF for the next three years, as he no prior experience whatsoever of the dairy sector. He was an engineer with several years of production experience in the textile industry before rapidly moving to top management positions in a series of small ailing companies in the fast moving consumer goods sector where he honed and proved his turnaround skills. He strongly believed that companies failed because they did not use the degrees of freedom they already had. He proved his word by involving internal people in creating new strategies, exploiting new markets and improving operational efficiencies in the companies he headed in ways that they had not foreseen.

Mr. Mohan Kumar was willing to take up the challenge at PMF as he saw his inexperience in the dairy industry more as an advantage rather than as a weakness - he felt that he would not be unduly biased by past experience. He was however ready and willing to rely on the guidance of the strong top management team of PMF that he was meeting for the first time but had heard excellent reports about. Moreover, he liked the idea of moving from Mumbai to the slightly smaller city of Raajpur (see Box 1 for a profile of Raajpur City), without losing on the advantages of living in a cosmopolitan city.

Mr. Mohan Kumar had been briefed about the PMF and the milk co-operative sector just before he was asked to join. He knew that the PMF was set up in 1985, with headquarters in Raajpur City, as the apex of the three-tier state level co-operative dairy structure established by

© Teaching Case developed by Ganesh N. Prabhu, Associate Professor, Corporate Strategy and Policy Area, Indian Institute of Management at Bangalore, Bannerghatta Road, Bangalore 560076 India. Email: gprabhu@iimb.ernet.in for the purpose of class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. This case was developed for a case analysis workshop in the National Milk Seminar held at Goa, January 18-19, 2002 and is based on substantive data on the Indian dairy industry developed by Tetra Pak India Private Limited and useful discussions with Jaideep Gokhale, Stefan A. Johansson and Sudhir Krishna of Tetra Pak, Anand Halve of Chlorophyll and Utkarsh Majmudar of Igate. The case setting including the dairy federation, brand names and the characters depicted are fictitious. However the cost data in the case is realistic and the case situation is representative of real situations faced by Indian dairy industry players and is therefore suitable for case analysis. *Version 3.0 dated July 30, 2004.*

the National Dairy Council initiative in dairy development (see Box 2 for details on the three tier dairy structure).

The PMF board of directors had farmer representatives from each district union as well as some government nominees. Some of the board members of PMF had greeted Mr. Mohan Kumar on his arrival in Raajpur and during the welcome party that the PMF top management had organised for him. They had voiced their hope that he would be able to turnaround the PMF.

Dairy Extension

Mr. Ethiraj Kasturi, 46, Manager (Extension) had set the ball rolling at the start of the meeting by briefing the new Managing Director about the dairy extension activities of the PMF. He said that these activities were oriented towards improving milk quality and productivity and reducing production costs at the farmer level (see Box 3 for details on dairy extension at PMF).

Mr. Kasturi said that though the scope and reach of PMF's extension activities was constantly increasing and were at a satisfactory pace, the cost of production for farmers was on the rise. He said that though most farmers had only two animals and looked upon dairying as a secondary activity, there was constant pressure from the village co-operatives on PMF to increase the procurement price as it was seen to be insufficient to meet the rising cost of milk production by the farmers.

At the present procurement price, he had estimated that a farmer with two milch animals could make a net profit of less than Rs. 1000 annually from dairy farming. The issue of the PMF not providing a remunerative milk price to farmers had even been raised in the Pradesh State assembly.

Milk Procurement

Mr. Pradeep Kanga, 48, Manager (Procurement) then briefed the new Managing Director about the milk procurement activities at PMF. Though, Pradesh State had an estimated average milk production of 100 lakh litres per day (LLPD), only an estimated 15% of milk production was processed by dairies (see Box 4

on milk transportation), while the rest was consumed locally in the village or sold locally by farmers.

Mr. Pradeep Kanga said that PMF had procured just over 3650 lakh litres of milk during 2000-2001 averaging 10 LLPD from village level co-operatives throughout the state. Procurement was growing steadily over the last few years at about 10% per annum and was likely to continue to grow at that rate. PMF paid a steady procurement price (currently Rs.9.50 per litre) for standard milk (3.5% Fat / 8.5% Solid Non-Fat) (see Box 5 for details on milk composition and pricing method) throughout the year.

He said that against an installed capacity of 16 LLPD, PMF's procurement had reached a peak of 12 LLPD in the winter and a low of 8 LLPD in the summer of 2000-2001. He explained that the seasonal variation was caused by the physiology of the animal and was relatively higher for buffalo milk (about 65% of PMF's procurement) than for cow milk.

Government decontrol in the dairy sector had lead to a number of small private dairies being set up within the state since 1995. These private dairies procured a total of 5 LLPD throughout the year. Private dairies procured only the quantity they required from local areas near their dairy and paid the farmers in cash. They typically matched the co-operative price point (Rs.9.50 per litre) during the winter (peak season) and paid higher prices of Rs.11 to Rs.12 per litre during the summer (lean season).

Given the steady procurement price provided by the village dairy co-operative, farmers in villages located near the private dairies had the best of both worlds. They typically sold milk at higher prices to the private dairy in summer and whatever milk was refused by the private dairy in winter was sold to the co-operative. Mr. Pradeep Kanga noted that this behaviour of farmers was against the co-operative norms and looked down upon by the village co-operatives, but little could be done by the PMF to prevent it. He said that it was also rumoured that some of the chairpersons of the village dairy co-operatives were themselves involved in selling milk to private dairies. However no action had been taken by the PMF as these chairpersons were seen to be politically connected and influential in the state.

Milk Processing

Mr. Ashwin Prasad, 47, Manager (Production) then took over to explain that since milk production was typically high in winter compared to summer, while liquid milk consumption was steady throughout the year, adequate processing facilities were essential to convert surplus milk procured in winter into milk powder, butter, butter oil, ghee and other products for storage and sale across the year.

He added that PMF had 15 chilling centres with 5 LLPD total capacity, 10 liquid milk processing plants (one plant per milk union) with 12 LLPD total capacity and a central dairy in Raajpur of 4 LLPD capacity set up at a cost of Rs.30 crores for processing milk and producing milk products. He explained that surplus milk that could not be potentially sold as liquid milk locally within a day of procurement had to be either sent by insulated milk tankers to other cities where demand exists or converted to products.

PMF had a shortfall in procurement in summer and while some milk was sold to other dairies, there were no cities in nearby states that had excess bulk demand in winter. Therefore, surplus milk procured in winter was usually spilt into butter (80% fat / 20% water) or butter oil/ghee (99.9 % fat) and skim milk powder (99.9% SNF/ 0.1% fat) by extracting water. Butter oil was not sold but was used to combine with skim milk powder and blended with fresh milk to meet the liquid milk demand shortfall in summer. This reverse process resulted in an additional unavoidable cost of Rs.3 to 4 per litre (Table 4).

Liquid Milk Sales

Mr. Murlidhar Mathur, 40, Manager (Sales and Distribution) said that the demand for milk within Pradesh State was growing at almost the same rate (4% yearly) as the growth in population in the state. PMF had steady liquid milk sales of an average of 7.5 LLPD with its own brand name *Raaj* within the urban areas of Pradesh. Of this 5 LLPD was sold in the state capital Raajpur (with a total estimated demand for processed milk 8 LLPD) while the rest was sold in smaller towns of Pradesh by district level dairies. PMF sold pasteurised 'toned' milk (3% Fat and 8.5% SNF) in plastic pouches at

Rs.6 for the 500 ml. pack (60% of sales value) and Rs.12 for the 1000 ml. pack (40% of sales value). Mr. Mathur drew the attention of Mr. Mohan Kumar towards the samples of plastic pouches with bold blue printing on display in the boardroom.

Mr. Murlidhar Mathur continued by mentioning that, like the practice in most major cities in India, milk was made available between 5 a.m. and 7 a.m. at PMF's 500 milk counters across the city of Raajpur. These milk counters were small independent tin sheds set up on municipal land and operated by local agents. They had no refrigeration facilities. Milk in plastic pouches packed in plastic crates was delivered by truck to the milk counters. The persons operating the milk counters had a margin of Rs.0.25 per litre. Some designated retailers (typically general stores) were also delivered milk in plastic pouches by the trucks at the same time. These retailers got the same margin of Rs.0.25 per litre and most retailers had their own refrigeration facilities and could sell unsold milk the next day. They therefore adjusted for any unsold milk by lowering their requirement for the next day.

While some customers bought milk at the milk counters at Rs.12 per litre, most customers bought coupons for a month's milk supply in advance and paid Rs.0.50 extra per litre for delivery of milk to their doorstep. The unsold milk and empty crates were brought back to the dairy by the same trucks on the return route. Unsold milk pouches if any were cut open and the milk was reprocessed. If the milk was spoiled, the fat was recovered and the rest of the milk converted to casein and whey.

Mr. Murlidhar Mathur explained that since milk is considered an essential commodity, constant pressure existed on the co-operative dairies from consumer groups and the government to keep the retail price of liquid milk under check. PMF was unable to raise the price easily, as each effort to do so was contested strongly by activist consumer groups and also reported negatively in the local press. In early 1999, when the price of milk was raised by Re. 1 to the present Rs. 12 per litre, consumer groups had raised the issue of the rising price of milk in the state assembly of Pradesh, but the PMF had stuck to its decision, quoting the non-viability of the earlier price point for their farmers.

Mr. Murlidhar Mathur said that several liquid milk brands existed though *Raaj* was the largest brand and had two-thirds market share in the state capital. The other three major brands with equal market shares currently were private brands *Panchambrut*, *Krishna* and *Ganga*. A brand audit done in 1998 had indicated that *Raaj* was by far the brand with the highest recall and had almost 100% trial. None of the other three brands had achieved more than 50% trial. Mr. Mohan Kumar recalled that on the flight to Raajpur, had read a sample survey report on the Pradesh liquid milk market that was prepared by a local market research firm for the PMF in early 2000 (see Box 6 for broad results of the survey).

Mr. Subhash Mathur, 44, Manager (Marketing) in his briefing to Mr. Mohan Kumar said that while the larger market for milk was price sensitive (as indicated by his brother and colleague Mr. Murlidhar Mathur), a small market survey of Raajpur in early 1997 had indicated that some customers were willing to pay more for convenience and quality. It was well known that several small private dairies located within Raajpur City were able to sell an estimated 0.3 LLPD of whole fresh buffalo milk (non-standardised but typically with 6% fat or higher) locally door delivered for as high as Rs.20 per litre. Whole milk was typically used for making sweets. There was also a small market of an estimated 0.1 LLPD for fresh cow milk (3% fat approximately) door delivered at Rs.15 per litre. This met the demand for customers who were averse to buffalo milk or specifically required cow milk for festival and religious ceremony related consumption.

Mr. Subhash Mathur said that as a follow-up on the survey results, PMF had entered the market for whole milk in 1997, at prices slightly lower than the private dairy rate at that time. However sales had been low. A small customer survey conducted in 1999 among customers that bought whole milk from private dairies had indicated that these customers by and large did not buy *Raaj* whole milk because it was not perceived to be as fresh as that supplied by the small local dairies. They felt that it would not give the right consistency when used for making sweets, though few had actually tried it.

Mr. Ashwin Prasad continued his briefing. He said that in late 2000, in an effort to expand the

local liquid milk market and to reach other milk markets outside the state, PMF had invested Rs. 5 crores in a 50000 LPD capacity aseptic packaging equipment in their product dairy at Raajpur from Tetra Pak India (see Box 7 for details on aseptic packaging). The PMF had hoped that this packaging called Tetra Fino Aseptic (TFA) would help PMF gain volumes and manage milk inventory better by addressing the need of customers for convenience and purity. Tetra Pak had also suggested that by creating product variety the PMF could initiate new modes and types of milk consumption to increase primary demand.

Mr. Subhash Mathur showed Mr. Mohan Kumar the TFA package of PMF on display in the boardroom. The brand name *Raaj Long Life* was printed in large white letters on a simple light blue background on the carton. Mr. Subhash Mathur said that despite its benefits, sales within the state of *Raaj Long Life* had been dismal and had stagnated at an average of 10000 LPD picking up slightly to 15000 LPD in summer. About two-third sales were in Raajpur City with the rest spread across the state.

Sales in the four neighbour states of Pradesh State had not been attempted. The PMF board had hesitated to invest in these states after a marketing consultant had indicated that a promotion outlay of atleast Rs.60 lakhs per state was required to create sales of about 10000 LPD in each of the states.

The higher processing costs, higher packaging costs and higher retailer margins compared to plastic pouches required PMF to charge a retail price of Rs. 12 for the 500 ml *Raaj Long Life* TFA packaged toned milk (3.0% Fat / 8.5% SNF). Though there was some margin (Table 5), the net profit on the product was thin after accounting for the Rs. 2 per 500 ml. package of depreciation and interest costs that had been calculated on an estimated sale of 7500 LPD at the time of installing the Tetra Pak plant.

Mr. Subhash Mathur said that the general opinion within the PMF was that little could be done to improve the sale of milk in TFA packaging. He quoted the results of a small survey conducted in early 2001 of the general stores retailing the product in Raajpur. The survey had indicated that customers found *Raaj Long Life* too expensive and though the retailers had tried to push the product at the counter

(given its higher margin), customers would demand the lower priced *Raaj* brand milk in a plastic pouch they knew was stocked in the retailer's refrigerator instead.

Mr. Subhash Mathur said that retailers had to pay cash on delivery for both plastic pouch milk and *Raaj Long Life* milk, and they claimed that the higher margins did not justify the long period they had to stock the product and block funds. Many retailers had subsequently withdrawn from *Raaj Long Life* or stocked it away from their prime display areas. PMF had considered this as an indicator that customers were not willing to pay high prices for milk.

Mr. Ashwin Prasad said that the PMF board had been concerned that the low margins and the high running costs, interest costs and depreciation on the aseptic packaging equipment that currently operated at low capacity utilisation was becoming unsustainable. In early 2001, the Pradesh State Hotelier's Association had approached the PMF to strike a 10000 LPD bulk deal for *Raaj Long Life* milk but negotiations had come to a halt as the association was unwilling to pay more than Rs. 18 per litre.

Mr. Mohan Kumar knew that competing brands of packaged plain milk from well-known national brands like *Parul* and *Foremost* were also being sold in retail stores in Pradesh State at slightly higher prices. He had visited the neighbourhood *Foodworld* store the previous evening and had seen these brands on display - 1000 ml Tetra Brik Aseptic (TBA) packages (see Box 7) at Rs. 26 retail.

In June 2001, *Foremost* had introduced skim milk (0.1% Fat / 8.5% SNF) as a premium brand targeted at health conscious people at Rs. 24 for a 1000ml TBA package. However, Mr. Mohan Kumar had seen tea stalls located in commercial areas in south Mumbai use the TBA packaged skim milk for making tea. Mr. Subhash Mathur said that the competitor Tetra Pak packaged brands were estimated to be selling about 4000 LPD in Pradesh State of which half the sales were of the *Foremost's* TBA brand of skim milk.

Milk Product Sales

Mr. Subhash Mathur added that the product plant at PMF made butter, milk powder, ghee and small quantities of flavoured milk, butter

milk, dairy whitener under its own brand name *Raaj* for the local Raajpur market. In an effort to enhance the brand image of the *Raaj* brand, the entire range of *Raaj* brand products had been featured over the last one year, twice a week in thirty-second local language advertisement spots during a popular soap opera and a popular cookery program on a local television channel. Mr. Murlidhar Mathur added that the range of products made by PMF served to enhance the image of the PMF as an organisation that made high quality value added products and therefore helped it capture more market share in liquid milk sales that were more profitable.

Mr. Sailesh Suman, 38, Manager (Accounts) supported his statement. He said that milk processed and sold as liquid milk is by far the most profitable mode of milk marketing for any dairy as processing and distribution costs are relatively low compared to conversion of milk to products (Table 6). Customers and retailers typically purchased liquid milk everyday on cash payment (or advance payment), while farmers are typically paid on a fortnightly basis; ensuring good cash float in liquid milk for both the dairy and the retailers. However, he added that margins were thin and far lower for the 500ml plastic pouches.

Mr. Subhash Mathur said that though nationally branded milk products did command a premium price, PMF could not justify the enormous investments in national brand building and distribution, given its small volumes. PMF could sell limited quantities of *Raaj* brand dairy whitener (skim milk powder) within the state and had to sell the rest of its stock within a few months in the unbranded milk powder wholesale market in Kolkatta City. The Kolkatta wholesale market was a difficult market to operate in and PMF usually got rates that did not even cover their conversion costs (Table 4). Most of the PMF's losses could be attributed to losses on sales of skim milk powder, said Mr. Sailesh Suman.

Mr. Sailesh Suman, who had earlier worked in Parul, said that that national brand was selling large quantities of milk products to the armed forces. Parul had sold 1000 tonnes of skim milk powder at Rs. 120 per kg. as well as 200 tonnes of sweetened condensed milk (400 gm of the product contained the equivalent of a litre of

1.5% Fat / 8.5% SNF milk) at Rs. 85 per kg. to the army in 1999. PMF had not made any headway on that front, even after Mr. Sailesh Suman made personal efforts after he joined PMF in 2000, as the army preferred to deal with one national brand rather than several regional ones.

Environmental Change

Mr. Mohan Kumar knew that with the signing of the World Trade Organisation (WTO) agreement by India, foreign companies would be able and willing to sell dairy products in India. He had recently read a news report that dairy companies in New Zealand were planning to sell milk powder and butter in India. On voicing his concern to the group, Mr. Ashwin Prasad responded that the bulkiness of the product combined with low margins would effectively prevent any county from shipping liquid milk to India. However, Mr. Subhash Mathur added, the branded and bulk milk products market could be potentially depressed by imports. He said that Indian customers were known to have a liking for foreign brands in general and foreign retail brands of cheese, butter, milk powder, that matched the prices of Indian brands, could potentially capture some market share even with little or no advertising. On the other hand Indian exports of milk and milk products were relatively low and unless Indian dairies exported more milk products or Indian consumers consumed more milk products, there would be a glut in the Indian market. All the dairies in India were debating on this issue but were undecided on their response.

The Question

As the scenario unfolded in the meeting, Mr. Mohan Kumar wondered about what immediate steps he could take to initiate the financial turnaround of the PMF. The PMF seemed to be well and truly squeezed between the farmers demanding higher prices for the milk they sold and the customers demanding lower prices for their milk they bought.

Mr. Mohan Kumar knew that the PMF scenario was similar to other state co-operative dairy federations in India. However, some were operationally more efficient, some had

locational advantages, some paid lower procurement prices and some commanded higher sale prices. A few dairy federations had developed national brands for milk product through sustained investment over decades in the market.

At the PMF however, there was no time to build a national brand and there was little money or time to do so! Mr. Mohan Kumar believed that his private sector experience would help him exploit whatever little degree of freedom he had in improving operational efficiencies. He planned to visit all the plants to make a check on the potential for operational improvements. National level benchmarking data from the National Dairy Council however seemed to indicate that there was little gap between the PMF and other state federations on operational parameters.

He believed that some degree of freedom could exist in expanding milk and milk product sales in the local market but his top management team seemed convinced about the high price sensitivity of the Pradesh customer and their unwillingness to pay for premium products. Yet something had to be done to deal with all the surplus milk that was being procured and converting it milk powder and then selling it at a loss was not the answer!

In his travels to Europe, Mr. Mohan Kumar had seen a wide range of specialised milk products in the supermarkets there. These products were relatively expensive and included liquid milk and milk products specially formulated for specific uses (such as tea/coffee or milk shake), with specific additives (such as vitamins and minerals) and for specific types of consumers (such as infants, children, pregnant women, lactating mothers, sports persons, geriatrics and people on a diet). The moot question was how many people in India will be interested in such specialised products, and more importantly, how many people will be willing to pay a premium for such products?

As an outsider to the dairy industry, Mr. Mohan Kumar knew that he lacked some credibility. It was imperative that he had to act fast, be decisive and carry his top management team with him.

Box 1: Profile of Raajpur City

Raajpur, the capital of Pradesh State is a major cosmopolitan city of about 400 square kilometres with a population of over 30 lakhs. It is a major commercial centre that has the headquarters of major private firms and is surrounded by several major industrial estates. It has the headquarters of the central army command. It has an international airport and has rail links to all the major metro cities in India. The two closest metro cities to Raajpur are both about 800 kilometres away. With no rapid means of local transport, Raajpur residents prefer to stay closer to their place of work. Residential rents are at sharp premiums near the two commercial centres of the city. The cost of living is high and next only to that of Mumbai and Delhi in India. Over half the upper and upper-middle income group households in Raajpur have working women. Upper income group women are seen as more modern and contemporary in their tastes than their counterparts in other major cities in India (apart from the metros). They were very open to convenience goods. They visit restaurants and supermarkets regularly.

Box 2: Co-operative Dairy Structure in Pradesh State

The basic philosophy of the dairy movement in India as promoted by the National Dairy Council was to build farmer owned co-operative milk processing facilities that provided farmers an assured outlet for their produce and the means to market quality milk and milk products in urban areas with high demand. As in other states in India, a three-tier structure was established in Pradesh State. This consisted of village level dairy co-operatives that farmers could become members of by paying a one-time membership fee of Rs.10 and continue as members by supplying a minimum quantum of milk every year. Each village co-operative had an elected chairperson who represented the village co-operative as members of district level milk unions. The district milk unions had an elected board from among the chairpersons of village co-operatives and each district union had a liquid milk-processing dairy that took care of district level local milk supply. The elected chairperson of each district union represented the district milk union on the board of the milk federation - the PMF - that was responsible for liquid milk sales in the state capital as well as production and marketing of milk products. Profits made by the PMF were distributed to farmers as "price difference" after keeping some reserve for developmental expenses.

Box 3: Dairy Extension

Dairy Extension covers a range of activities that provide education, training and other services to improve the milk quality and productivity and reduce production costs at the farmer level. In the PMF, these include farmer training and awareness programs on feeding, hygiene and treatment of common ailments. Veterinary doctors visit villages for treating major ailments of milch animals and to conduct artificial insemination to improve their breed. These extension activities are subsidised and supported directly and indirectly by several government schemes and are valued by farmers.

Box 4: Milk Transportation

Milk is transported in 40 litre cans twice daily to the dairies. If the dairy is at a considerable distance from the village milk co-operative then milk is transported to nearby chilling centres that are used to preserve the liquid milk for short periods till it can be transported in bulk to the dairy. Chilling centres are essential in some locations as the village co-operatives did not have refrigeration facilities and milk can only be preserved for long periods at temperatures below 4 degrees Centigrade.

Box 5: Milk Composition and Pricing Method

Milk supplied by farmers to the village milk co-operative had to meet certain quality standards and was purchased and sold on the basis of the percentage of fat and solids non-fat (SNF) that it contains by weight. While the fat part of milk contains energy, the SNF part of milk contains vitamins and other nutrients. Dairy processing can separate the two parts and adjust their proportion. The purchase price of milk (currently Rs. 9.50 per litre at PMF) is usually stated for standard milk containing 3.5% Fat and 8.5% Solids Non Fat (SNF). Any variation in the composition from the standard leads to an increase or decrease in price based on the price of fat and SNF (currently Rs. 80 per kg and Rs. 70 per kg respectively). Therefore if milk procured had 0.5% higher than standard fat and 1.0% higher than standard SNF it would be priced at $Rs.9.50 + (0.005 * 80) + (0.01 * 70) = Rs.10.60$ per litre. A calculation chart was released annually by the PMF that depicted the rates for each fat and SNF percentage.

Box 6: Liquid Milk Purchase Behaviour in Raajpur

Over 80% of liquid milk sold by dairies in Pradesh State was packaged in plastic pouches while the rest was sold loose. In Raajpur City, over 75% of dairy milk consumption was in the three lakh households in the middle income and upper income groups, while the rest was institutional sales. Over two-thirds of urban households took door delivery while the rest bought milk at a milk booth or at a retail store (equal shares). About 10% of consumers that bought milk in plastic pouches for making curd, tea or coffee also bought loose milk from private dairies for direct consumption as milk. Consumption was an average of 1.5 litres per household per day in the middle and upper income groups in urban Pradesh State - their average household expenditure on milk was Rs.550 per month. Customers typically boiled milk before consumption and preferred hot to cold milk. Consumption was evenly split between children (20% of total consumption) and adults (20% of total consumption). Over two-thirds of these households used milk for making curds (25% of total consumption) and almost all households used milk for making tea or coffee (25% of total consumption). The remaining 10% of consumption was for making sweets and other uses. Coffee and tea consumption was high in offices also. Most customers considered home delivery an essential service. There was no dissatisfaction on quality and convenience except that some customers taking home delivery complained about the unreliable supply of 500ml milk pouches - with delivery boys insisting on the customer buying the 1000ml pouch instead. Over two-thirds of households that bought milk on regular home delivery also bought additional quantities of liquid milk to meet sudden requirements or cover irregular supplies in their home delivery atleast twice a month. These households relied on the local retail store that stored plastic pouch milk in their refrigerators to meet such demand.

Box 7: Aseptic Packaging of Milk

Aseptic packaging in Tetra Fino Aseptic (TFA) is a world-class packaging technology for perishable liquid products from Tetra Pak, the world leaders in liquid food packaging. The aseptic packaging equipment at PMF was capable of UHT (ultra high treatment) processing and aseptically packaging milk in 500 ml packages called TFA, that ensured that milk stayed fresh for upto 8 weeks after dispatch without any refrigeration (until it was opened). Unlike plastic milk pouches, TFA packages could not be tampered with and could not be opened and re-sealed. Customers could consume the milk directly without boiling it and therefore destroying milk nutrients. The UHT technology required that only the best quality milk be segregated for aseptic packaging in TFA packages. Tetra Brik Aseptic (TBA) was a similar aseptic package from Tetra Pak, except that it was slightly thicker and in a brick form and could last for three months. The UHT process for milk was identical for both TFA and TBA packaging.

Table 1
Pradesh Milk Federation: Milk Procurement, Milk Disposal & Product Portfolio

Description		Unit	1999	2000	2001	2002(P)
1	Milk Procurement	LPD	840,000	910,000	1,000,000	1,100,000
2	Milk Disposal		840,000	910,000	1,000,000	1,100,000
a.	Consumer Liquid Milk Sale					
	Toned Milk 1000 ml (Pouch)	LPD	280,000	290,000	300,000	322,000
	Toned Milk 500 ml (Pouch)	LPD	420,000	437,000	450,000	473,000
	Toned Milk 500 ml (TFA)	LPD	-	-	10,000	12,000
	Whole Milk 1000 ml (Pouch)	LPD	15,000	15,600	16,500	17,200
	Whole Milk 500 ml (Pouch)	LPD	25,000	26,000	27,000	28,100
b.	Bulk Sales to Other Dairies		40,000	25,000	15,000	15,000
c.	Products					
	Curds (Pouches)	LPD	30,000	31,200	32,400	33,700
	Flavoured Milk in (Bottles)	LPD	3,000	3,500	4,000	5,000
	Butter Milk (Pouch)	LPD	3,000	3,500	4,000	5,000
	Milk Powder (Consumer)	Tons/Day	0.17	0.22	0.26	0.30
	Milk Powder (Bulk)	Tons/Day	1.91	6.58	12.01	16.13
	Ghee (Consumer)	Tons/Day	4.14	4.84	5.13	5.56
	Ghee (Bulk)	Tons/Day	4.86	5.92	7.69	9.08
	Butter (Consumer)	Tons/Day	3.78	4.84	5.13	5.56
	Butter (Bulk)	Tons/Day	5.23	5.92	7.69	9.08

Table 2
Pradesh Milk Federation: Contribution from Products

Description		Unit	1999	2000	2001	2002(P)
1	Milk Disposal	LPD	840,000	910,000	1,000,000	1,100,000
Contribution from Products						
a.	Consumer Liquid Milk Sale					
	Toned Milk 1000 ml (Pouch)	Rs./ Litre	1.00	0.75	0.67	0.67
	Toned Milk 500 ml (Pouch)	Rs./ Litre	0.90	0.65	0.55	0.55
	Toned Milk 500 ml (TFA)	Rs./ Litre			4.15	4.15
	Whole Milk 1000 ml (Pouch)	Rs./ Litre	0.85	0.60	0.67	0.67
	Whole Milk 500 ml (Pouch)	Rs./ Litre	0.75	0.50	0.55	0.55
b.	Bulk Sales to Other Dairies	Rs./ Litre	0.25	0.15	0.15	0.15
c.	Products					
	Curds (Pouches)	Rs./ Litre	0.75	0.50	0.55	0.55
	Flavoured Milk in (Bottles)	Rs./ Litre	3.00	2.50	2.00	2.00
	Butter Milk (Pouch)	Rs./ Litre	0.75	0.50	0.55	0.55
	Milk Powder (Consumer)	Rs./ Ton	11,500	8,625	5,750	5,750
	Milk Powder (Bulk)	Rs./ Ton	(25,000)	(28,750)	(34,500)	(34,500)
	Ghee (Consumer)	Rs./ Ton	20,000	18,000	16,000	16,000
	Ghee (Bulk)	Rs./ Ton	5,000	2,500	1,000	1,000
	Butter (Consumer)	Rs./ Ton	20,000	18,000	16,000	16,000
	Butter (Bulk)	Rs./ Ton	5,000	2,500	1,000	1,000

Table 3
Pradesh Milk Federation: Contribution from Products & Profitability

Description		Unit	1999	2000	2001	2002(P)
1	Milk Disposal	LPD	840,000	910,000	1,000,000	1,100,000
Contribution from Products						
a.	Consumer Liquid Milk Sale					
	Toned Milk 1000 ml (Pouch)	Rs.	280,000	217,500	201,000	215,740
	Toned Milk 500 ml (Pouch)	Rs.	378,000	284,050	247,500	260,150
	Toned Milk 500 ml (TFA)	Rs.	-	-	41,500	49,800
	Whole Milk 1000 ml (Pouch)	Rs.	12,750	9,360	11,055	11,524
	Whole Milk 500 ml (Pouch)	Rs.	18,750	13,000	14,850	15,455
b.	Bulk Sales to Other Dairies	Rs.	10,000	3,750	2,250	2,250
c.	Products		-	-	-	-
	Curds (Pouches)	Rs.	22,500	15,600	17,820	18,535
	Flavoured Milk in (Bottles)	Rs.	9,000	8,750	8,000	10,000
	Butter Milk (Pouch)	Rs.	2,250	1,750	2,200	2,750
	Milk Powder (Consumer)	Rs.	2,000	1,875	1,500	1,750
	Milk Powder (Bulk)	Rs.	(47,826)	(189,250)	(414,300)	(556,500)
	Ghee (Consumer)	Rs.	82,883	87,183	82,012	89,033
	Ghee (Bulk)	Rs.	24,324	14,800	7,689	9,079
	Butter (Consumer)	Rs.	75,676	87,183	82,012	89,033
	Butter (Bulk)	Rs.	26,126	14,800	7,689	9,079
	Total Contribution per Day	Rs.	896,433	570,351	312,775	227,679
	Contribution per Annum	Rs.	327,197,940	208,178,127	114,163,012	83,102,726
2	Manpower, Administrative & Promotional Expenses					
	1 Employees Cost	Rs.	75,000,000	82,500,000	90,750,000	99,825,000
	2 Administrative Expenses	Rs.	13,500,000	14,750,000	16,500,000	18,000,000
	3 Advertising & Sales Promotion	Rs.	16,256,250	19,125,000	22,500,000	15,000,000
	Total Expenses	Rs.	104,756,250	116,375,000	129,750,000	132,825,000
	Net Profit/Loss	Rs.	222,441,690	91,803,127	(15,586,988)	(49,722,274)

Table 4
Pradesh Milk Federation: Skimmed Milk Powder Costing

No.	Description	Per Litre	per Kg SMP Bulk	per kg SMP Branded
1	Cost of Milk per litre to Farmer	9.50	114.00	114.00
2	Chilling & Transportation Costs	0.53	6.36	6.36
3	Skimming costs	0.05	0.60	0.60
4	(-) for fat removed from the milk (3.5%)	-2.80	-33.60	-33.60
5	Transportation (400 Kms)	0.40	4.80	4.80
6	Cost of conversion per litre (Rs 18 per Kg SMP)	1.50	18.00	18.00
7	Cost of packaging (Bulk - Rs 24 per 25 Kg bag) (Branded - Rs. 3.20 per 500 gm bag)	0.08	0.96	6.40
8	Transportation back to Dairy (400 Kms)	0.03	0.40	0.40
9	Inventory Carrying Cost (30 Days @ 18% p.a.)	0.12	1.49	1.49
10	Cost of product Ex- Dairy	9.42	113.01	118.45
11	Freight Average (Rs 4000 per 8 Tonnes)			0.50
12	Sales Tax on the product @ 8% average			9.48
13	Distributor Margin (6%)			7.68
14	Retailer Margin (15%)			20.41
15	Total Variable Cost of the product	9.42	113.01	156.51
16	Margin for PMF	-3.58	-43.01	-16.51
17	Market Price of product	5.83	70.00	140.00

Table 5
Value Chain for Raaj Long Life Tetra Fino Aseptic (TFA) Packaged Milk (500 ml- 3.0% Fat, 8.5% SNF)

No.	Description of Cost Element	500ml TFA	Per Litre 500ml TFA	Cumulative 500ml TFA	Notes
	From Farmer to Dairy Gate				
1	Cost of Raw Milk to Farmer (3.5% Fat - 8.5% SNF)	4.750	9.500	9.500	
2	Society Charges / Agents Commission	0.050	0.100	9.600	
3	Transportation cost from Society to Chilling Centre	0.100	0.200	9.800	
4	Chilling Costs at Chilling Centre (CC)	0.075	0.150	9.950	
5	Secondary Transportation (CC to Dairy)	0.075	0.150	10.100	
	From Dairy Gate to End of Processing				
6	Cost of Standardisation (3.0% Fat - 8.5% SNF)				
	a) Removal of Fat @ 90 Rs per Kg	-0.200	-0.400	9.700	Fat removed is sold as Butter or Ghee
	b) Addition of SNF @ Rs 70 per Kg	0.000	0.000	9.700	At times SNF is low and hence SNF addition is required.
7	Process Losses at 1%	0.049	0.097	9.797	
	Processing Costs (Standardisation/Pasteurisation)	0.215	0.430	10.227	Includes Utilities, Direct Manpower Costs, Repairs & Maintenance
8	Processing Costs (UHT Processing)	0.600	1.200	11.427	
	Process Losses - UHT @ 0.5 %	0.029	0.057	11.484	
	From End of Processing to Despatch from Dairy				
9	Primary Packaging (TFA)	2.180	4.360	15.844	
	PM Losses (Primary - 2%)	0.044	0.087	15.931	
	Carton packing labour	0.050	0.100	16.031	
10	Secondary Packing Cardboard Box	0.500	1.000	17.031	Rs. 10 per box, 20 packs per box
	Secondary PM Losses (2%)	0.010	0.020	17.051	
11	Administrative Manpower Costs	0.025	0.050	17.101	
12	Other Administrative Overheads	0.025	0.050	17.151	
13	Dairy Profit/Loss	2.024	4.049	21.200	
	From Dairy Gate to Customer				
14	Transportation Costs from Dairy to Market	0.350	0.700	21.900	Weighted average transportation costs @Rs 0.70 per litre
15	Margin for distributor	0.350	0.700	22.600	
16	Margin for Retailer	0.700	1.400	24.000	
17	Consumer Price Printed on the Pack	12.000	24.000	24.000	Delivered price to Consumer

Table 6
Value Chain for Raaj Toned Milk Sold in Plastic Pouches (3% Fat / 8.5% SNF)

No.	Description of Cost Element	1000ml	Cumulative	500ml	Per Litre	Cumulative	Notes
		Pouch	1000Pouch	Pouch	500Pouch	500Pouch	
	From Farmer to Dairy Gate						
1	Price of Raw Milk to Farmer (3.5% Fat - 8.5% SNF)	9.500	9.500	4.750	9.500	9.500	
2	Society Charges / Agents Commission	0.100	9.600	0.050	0.100	9.600	
3	Transportation cost from Society to Chilling Centre	0.200	9.800	0.100	0.200	9.800	
4	Chilling Costs at Chilling Centre (CC)	0.150	9.950	0.075	0.150	9.950	
5	Secondary Transportation (CC to Dairy)	0.150	10.100	0.075	0.150	10.100	
	From Dairy Gate to End of Processing						
6	Cost of Standardisation (3% Fat - 8.5% SNF)						
	a) Removal of Fat @ 90 Rs per Kg	-0.400	9.700	-0.200	-0.400	9.700	Fat removed is sold as butter or ghee
	b) Addition of SNF @ Rs 70 per Kg	0.000	9.700	0.000	0.000	9.700	At times SNF is low and hence SNF addition is required.
7	Process Losses @ 1 %	0.097	9.797	0.049	0.097	9.797	
8	Processing Costs (Standardisation/Pasteurisation)	0.430	10.227	0.215	0.430	10.227	Includes utilities, direct manpower costs, repairs & maintenance.
	From End of Processing to Despatch from Dairy						
9	Primary Packaging (Plastic Pouch)	0.405	10.632	0.297	0.594	10.821	Material cost Rs. 90 per kg (4.5gms for 1000 ml) or (3.3 gms for 500 ml)
	PM Losses (Primary - 2%)	0.008	10.640	0.006	0.012	10.833	
10	Secondary Packaging (Plastic Crate Returnable)						
	a) Cost of Crate replacement	0.014	10.654	0.006	0.011	10.844	Rs. 150/crate. 10 packs per crate of 1000ml, 24 packs per crate of 500ml. Crates last three years.
	b) Crate Damages and Losses (5%)	0.008	10.661	0.003	0.006	10.851	
	c) Crate Washing (Utility cost)	0.020	10.681	0.008	0.017	10.867	
11	Administrative Manpower Costs	0.050	10.731	0.025	0.050	10.917	
12	Other Administrative Overheads	0.050	10.781	0.025	0.050	10.967	
13	Dairy Profit/Loss	0.569	11.350	0.225	0.449	11.417	
	From Dairy Gate to Customer						
14	Transportation Costs from Dairy to Market	0.400	11.750	0.167	0.333	11.750	Same cost ratio as ratio of crates
15	Margin for Home Delivery Agent	0.250	12.000	0.125	0.250	12.000	
16	Consumer Price Printed on the Pack	12.000	12.000	6.000	12.000	12.000	
17	Charges for Home Delivery (Delivery Boy)	0.500	12.500	0.250	0.500	12.500	Delivered price to customer