



**MYSORE DAIRY, A UNIT OF MYSORE – CHAMARAJANAGARA DISTRICT
CO-OPERATIVE MILK PRODUCERS' SOCIETIES' UNION LTD.,
T.NARASIPURA ROAD, SIDDHARTHANAGAR, MYSORE – 570 011.
KARNATKA**

UNIT PROFILE:

MYSORE DAIRY, A UNIT OF Mysore – Chamarajanagara District Co-Operative Milk producers. Union Limited registered under the Karnataka co-operative act has been commissioned in the year 1980. The rated when commissioned was 60 TKPD (Thousand Kgs per day) and was subsequently expanded to 180 TKPD by NDDDB under the turn key project in the year 1996.

The dairy receives milk in cans with temperature of 27⁰ C to 32⁰ C from village co-operatives located in the districts of Mysore and Chamarajanagara and in tankers with temperature of 5⁰C to 6⁰C from the three chilling centers located at Hunsur, Kollegala and Chamarajanagara towns. Also the dairy receives milk with temperature of 5⁰C to 6⁰C in tankers from 32 Bulk Milk Coolers. These bulk milk coolers have been installed to maintain the initial quality of raw milk and also to reduce the intake of energy intensive raw materials. As on date the per day quantity of milk received through cans directly from dairy co-operatives, tankers from chilling centers and tankers from bulk milk coolers is as follows:

❖ In cans from village dairy co-operatives	65000 Kgs
❖ In tankers from chilling centers	131000 Kgs
❖ In tankers from bulk milk coolers	71500 Kgs

The dairy processes the milk and packs the following qualities of milk:

1. **Toned milk** with 3.1% Fat & 8.5% Solids not fat
2. **Standardised milk** with 4.6% Fat & 8.5% Solids not fat
3. **Double toned milk** with 1.6% Fat & 9% Solids not fat
4. **Full cream milk** with 6.1% Fat & 9% Solids not fat

In addition, the following milk products are manufactured in smaller quantities during 2007-08:

- Ghee 1070.19 Metric Tonnes
- Butter 1206.465 Metric Tonnes in bulk packings of 25 Kgs
- Curd 7420.94 Metric Tonnes
- Peda 55.25 Metric Tonnes
- Mysore pak 15.90 Metric Tonnes
- Sweet Lassi 236.915 Metric Tonnes
- Butter milk 243.463 Metric Tonnes
- Badam Burfi 214 Kgs
- Cashew Burfi 238 Kgs

The dairy markets milk and milk products under the trade name “NANDINI” a registered trade name of “Karnataka Milk Federation”, the apex institution at the state level.

The technical and financial assistance comes from National Dairy Development Board, Anand, Gujarat under operation flood and vision schemes.

The one of the market developing activities taken up by the dairy is Creating awareness about milk in public especially among the women folk and school children through “ARIVU” programs by trained employees and the dairy has conducted 500+ “ARIVU” programs more than 50000 people took part and also under the consumers and school children awareness programs 45000 members participated and 15000 houses were visited under door to door campaign till 2007-08. **For the first time under consumer awareness program**



Farmers, School children, Medical/health science & Consumers visit to dairy Mysore Dairy has started Mini Bus Service to bring Consumers from different areas of the town & talukas to Dairy & explain them the activities of the Dairy as well as brief them on Saving Energy in house hold usage. Under this program during 2007-08 around 8000 consumers visited the Dairy. One of the agenda in all the above programs was educating the participants on energy conservation. The cartoon film on “Save Energy” was screened at the school children programs. And Mysore dairy has also arranged to bring the farmers from villages & to educate them on clean milk production ,Energy savings etc.

During the year 2007-08 School Children painting competition was held at Nanjanagud, Hunsur of Mysore Dist. The first three best paintings were rewarded.

In this occasion the children were briefed about the Energy conservation procedures at domestic level & cartoon film “ Save Energy “ was screened & in the competition “Energy Saving “is also given as a Theme.



Children participation in Painting Competition

The dairy had secured the **ISO-9001 : 2000** certificate for the years 2004-2008. The recertification audit was conducted by the certifying agency and **ISO-9001 : 2000** certificate has been renewed to the next three years.

Summary Of Classified Energy Saving Measures implemented during 2007-2008

Retrofitting/Minor Modifications of existing equipment – Low investment options

- ✓ Replacement of damaged/leaking compressed air pipe lines
- ✓ Replacement of damaged/leaking chilled water pipe lines
- ✓ Replacement of damaged insulation of steam pipes/equipment/chilled water tanks

Replacement/Installation/Modernisation of old and inefficient existing equipment and systems – High investment options

- ✓ Upgrading insulation of steam distribution pipelines, equipment, chilled water pipe lines, and replacement of old Milk pasteuriser, automation of Steam controlling system etc.

Process Monitoring and Controls

- ✓ Compressed air pressure monitoring

Reduction in usage of energy intensive raw materials

- ✓ Establishment of Bulk Milk Coolers to receive chilled milk from Dairy Co-operative Societies.

Reduction of water consumption in the plant

- ✓ Maintenance of Rain Water Harvesting system

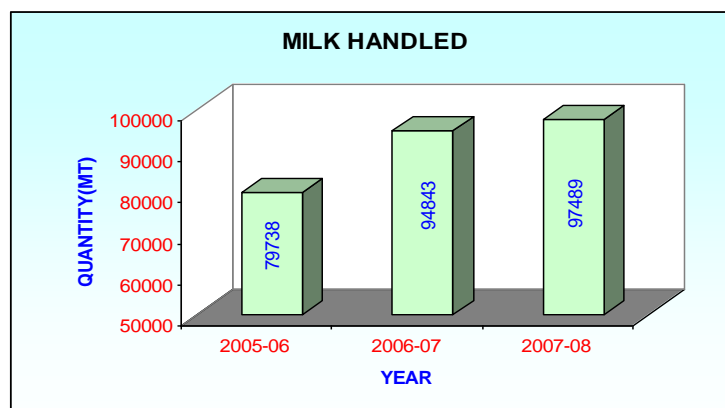
Recycling of material

- ✓ Utilisation of treated effluent for gardening & Methane gas Utilisation for cooking purpose.

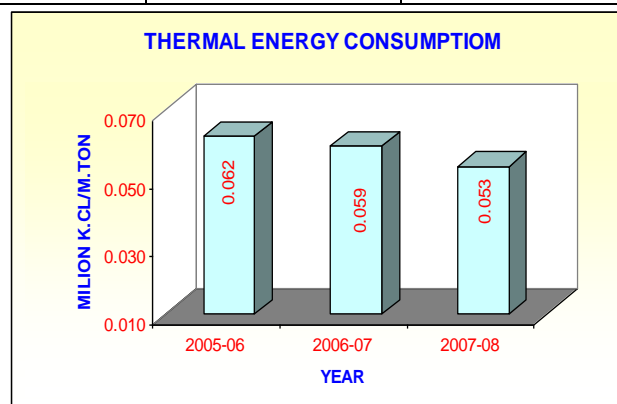
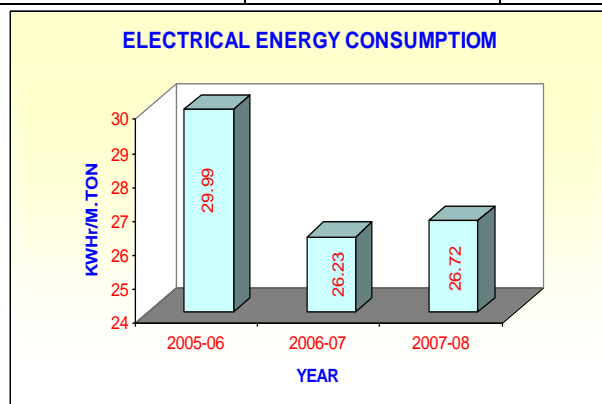
ENERGY CONSUMPTION:

The energy consumption and milk handled at the dairy in the years 2005-2006, 2006-2007 & 2007-08 is as follows:

DESCRIPTION	UNIT	2005-2006	2006-2007	2007-08
Milk Handled	M. Tonnes	79738.38	94843.45	97489.45
Total energy cost	Rsin Lakhs	214.598	250.015	269.930
Energy cost v/s Manufacturing expenses	Percent	22.52	23.51	26.33
Total energy consumption – Electrical	Lakhs kWh	23.068	24.251	26.111
Specific energy consumption -Electrical	KWh/Ton	29.985	26.233	26.716
Total energy consumption – Thermal	Million Kcals	4954.58	5641.09	5222.27
Specific energy consumption – Thermal	Million Kcals	0.06214	0.05945	0.05343



Year	Qty Milk Handled	Capacity Utilisation	Electrical Energy (Lakh KWHR)	Thermal Energy (MK cals)
2005-2006	79738.38	145.04	23.909	4954.58
2006-2007	94943.45	173.23	24.829	5641.09
2007-2008	97489.45	148.39	26.111	5222.27



There has been a steady increase in milk handling and notable decrease in consumption of energy during the years 2003-2008. The dairy had launched the Energy Conservation Program in the year 2001. National Dairy

Development Board (NDDDB), Institute Of Rural Management, Anand (IRMA) & Karnataka Milk Federation (KMF) facilitated the launching of the said program. The outcome of this program was that the dairy was able to gear up the employees towards saving of energy. This has been a continuous process and the objectives of this team has been slightly modified and this team is heading towards “TOTAL QUALITY MANAGEMENT”.

ENERGY CONSERVATION COMMITMENT, POLICY AND ORGANISATIONAL SET UP

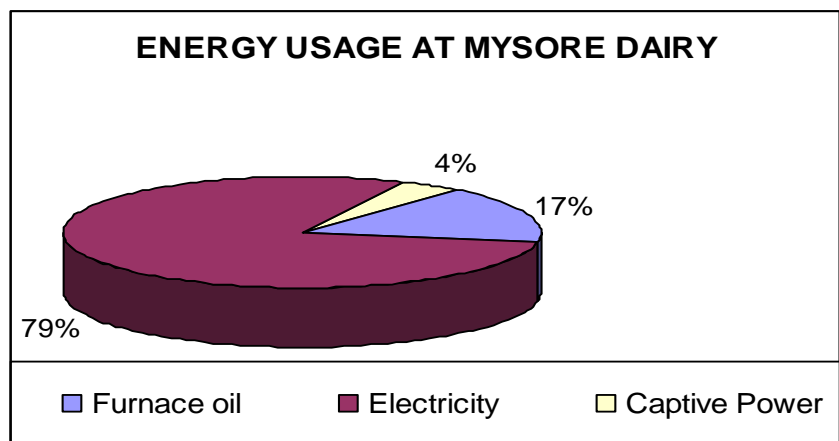
“TOTAL QUALITY MANAGEMENT TEAM”

Mysore Dairy transformed the Energy conservation team to which is putting forth a continuous approach to sustain the achievements made on energy conservation with due stress on improvement of product quality. Hence, the product quality was not sacrificed while saving energy. Cross functional teams were formed and the philosophy of energy conservation and quality improvement and sustainability were inculcated among all the employees by way of lectures and discussions. The dairy follows the 5 “S” house keeping principles with due stress on kaizen- continual improvement, Good manufacturing and hygienic practices. Two 5 S teams inspects and suggests the corrective actions on 5 S principles. The ideas from the employees contributed to a greater extent in achieving cost reduction and quality improvement.

The sources of energy in the dairy are Electricity and Furnace oil. The energy cost is 23 to 26 % of the total manufacturing cost of the dairy.

The total connected load is 776 KW or 970 KVA and maximum demand is 500 KVA.

Electricity occupies the top position in the energy profile, since 79.% of the energy is generated with the help of electricity. The refrigeration



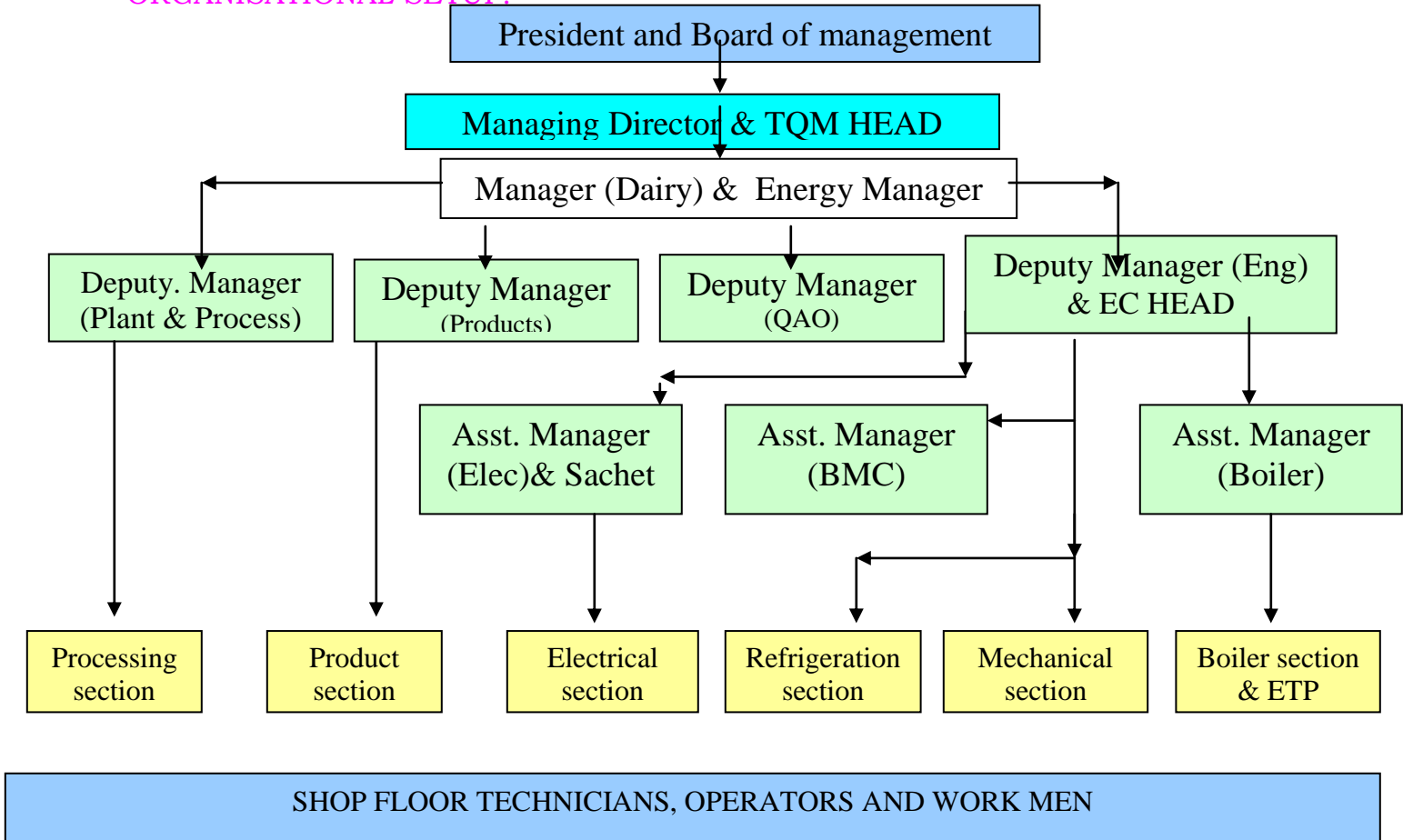
section is the of this source of energy, wherein more than 50% of the total electrical energy is used by this section. Hence, major thrust was given in conserving energy in this section.

This section has 4 ammonia compressors, two driven by 2 Nos 100 Hp, one driven by 125 Hp and one by 120 Hp motor. In addition the dairy has 2

booster compressors driven 2 Nos. 20 Hp motors. Also there are 4 Nos. chilled water pumps driven by 4 Nos. 10 Hp motors. The section has two plate heat exchange type condensers with two 30 Hp motors. The total running hours of ammonia compressors and chilled water pumps ranges between 20-22 hours per day. At any given point of time 2 ammonia compressors and 3 chilled water pumps and one condenser will be in operation while the rest are utilised as standby. In addition to this the section has 03 evaporative condensers with 30 Hp motors.

Furnace oil is another source of energy. This constitutes 20 % of the total energy. The major user of this energy is the milk processing section wherein more than 75% of the thermal energy is utilised. Thus this was the major section wherein the thermal energy saving efforts were put forth.

ORGANISATIONAL SETUP:



ENERGY CONSERVATION POLICY:

THE EMPLOYEES & MANAGEMENT OF MYSORE-CHAMARAJANAGAR MILK UNION ARE COMMITTED TO CONSERVE & SUSTAIN THE CONSERVED ENERGY AT ALL LEVELS OF PROCESSING OF MILK & MILK PRODUCTS BY ADOPTING MODERN, ECO-FRIENDLY & ENERGY EFFICIENT TECHNOLOGIES TO OFFER THE SUPREME QUALITY MILK & MILK PRODUCTS TO CUSTOMERS AT COMPETITIVE PRICE WHILE TRANSFERRING REMUNERATIVE PRICE TO THE PRODUCERS.

ENERGY CONSERVATION ACHIEVEMENTS:

During 2003-2008, Mysore dairy has implemented 24 energy saving projects through engineers initiatives, sub section team suggestions and innovative ideas by officers and have achieved savings of Rs. 63.10 Lakhs with an investment of Rs. 158.45 Lakhs resulting in 21.55% reduction in specific electrical energy consumption and 14.48% in specific thermal energy consumption.

The energy saving projects implemented during 2007-08:

1. Replacement of Auto Control system of Milk Pasteuriser :

One of the 10 KL Milk pasteurizers was running without auto controls. New Auto control system is installed to this pasteurizer with the help of IDMC, Bangalore. On running these pasteurizer we observed lesser consumption of steam since the heating temperature was maintained between 73 ° C to 75 ° C



AUTO CONTROL OF MILK PASTEURISER

➤ Furnace oil required to generate 1000 Kgs steam	76.92 Litres
➤ Steam consumed by 10 TKPD pasteuriser if the Pasteurization temperature is 78-85° C	200.00 Kgs
➤ Furnace oil requirement to run the pasteurizer for 1 hour	15.38 Kgs
➤ Steam consumed by 10 TKPD pasteuriser when the Pasteurization temperature is 73-75° C	150.00 Kgs
➤ Running hour of each pasteurizer per day	12 Hrs.
➤ Furnace oil saved by one pasteurizer/day	46.2 Lts.
➤ Furnace oil saved by /year	16863 Lts.
➤ Savings per annum	Rs. 4.89 Lakhs

2. Replacement of Control system of Curd Milk Pasteuriser :

The auto control system of Curd milk pasteurizer was out of order & attempts to repair it was failed. Hence new auto control system was installed for the curd milk pasteurizer with the help of IDMC, Bangalore. & we could able to save energy in the form of furnace oil as below.



Control system for Curd Milk Pasteuriser

- Furnace oil required to generate 1000 Kgs steam 76.92 Litres
- Steam consumed by 3 TKPD Curd Milk pasteuriser if the Pasteurization temperature is 90-92° C with out auto control 200.00 k
- Furnace oil requirement to run the pasteurizer for 1 hour 15.38 Kgs
- Steam consumed by 3 TKPD pasteuriser when the Pasteurization temperature is 90-92° C with auto control 150.00 Kgs
- Running hour of each pasteurizer per day 9 Hrs.
- Furnace oil saved by one pasteurizer/day 34.68 Lts.
- Furnace oil saved by /year 12647.25 Lts.
- Savings per annum Rs. 3.67 Lakhs**

3. Replacement of old Milk Pasteuriser :

The Dairy had three 10 Kl Milk Pasteurisers. Out othis one of the pasteurizer was very old & Energy consumption was very much high in this Equipment. Hence this pastueriser was replaced with New IDMC 10 Kl Pasteuriser with full auto control Units.

So that we could able to reduce the energy consumption when compared to Old Milk Pasteuriser & hence we could able to save Rs.8.14 Lakh per year.



New Milk Pasteuriser

➤ Furnace oil required to generate 1000 Kgs steam	76.92 Litres
➤ Steam consumed by 10 TKPD pasteuriser if the Pasteurization temperature is 78-85° C	250.00 Kgs
➤ Furnace oil requirement to run the pasteurizer for 1 hour	19.23 Kgs
➤ Steam consumed by 10 TKPD New pasteuriser when the Pasteurization temperature is 73-75° C	150.00 Kgs
➤ Running hour of each pasteurizer per day	10 Hrs.
➤ Furnace oil saved by one pasteurizer/day	77 Lts.
➤ Furnace oil saved by /year	28105 Lts.
➤ Savings per annum	Rs. 8.15 Lakhs

4.Replacement of Old Khoa Vat :

Mysore Dairy is manufacturing good Quantity of Peda to fulfill the demand of the market. Dairy is having Two Khoa Vats of Capacity 18 Kgs /Batch. Out of this One of the vat is very old & heavy leakage of Steam is observed & hence the steam consumption per hour is 18.20 % more than the standard requirement of 80 kgs of Steam. Hence this Khoa vat is replaced with New energy efficient equipment.



Old Khova Vat



New Energy Efficient Khova Vats



➤ Standard requirement of Steam per Hour	: 80 Kgs
➤ Actual consumption of Steam per Hour	: 90 Kgs
➤ Time required per Batch	: 90 mts
➤ Steam consumption per Batch	: 135 k
➤ By replacing old Khoa vat	: 120 Kgs
➤ Saving of steam per batch by replacing Vat	: 15 kgs
➤ No of Batches /Day	: 05
➤ No of Batches /year	: 18
➤ Saving of steam /year	: 27375 kgs
➤ Saving of Furnace oil	: 2027 ltrs
➤ Amount saved per year	: Rs. 58793/-

ENERGY CONSERVATION PLANS AND TARGETS:

- 1) Replacement of old 9 x 9 Frick Ammonia compressor by efficient & energy saving new Vilter compressors with an estimated amount of Rs.8 Lakhs & this projected is targeted for 2008-09.
- 2) Replacement of Old inefficient 2 Mt/hr Boiler with New Energy efficient 3 MT/hr Boiler with pre Air Heater & online flue gas analyzer & online Fuel –oil meters. The same is targeted for 2008-09,09 -10

- 3) Installation of butter pre-stratification tank & butter melting vat :- The dairy is manufacturing Ghee from butter by using ghee vat. The approximate savings expected is Rs. 3.30 lakhs and the proposed investment is Rs. 9 lakhs. This project is targeted for 2008-09.
- 4) Replacement of old inefficient Electrical transformers with efficient Transformers. This project is targeted for 2008-09
- 5) Replacement of Cream Pasteuriser with auto controls: This project is targeted for 2009-10

ENVIRONMENT AND SAFETY:

Actions have been initiated to get the HACCP & EMS 14000 certification. The target date is by the end of year 2009-10

All the safety measures suggested by the statutory authorities have been implemented. The Dairy has implemented the **ON-SIGHT EMERGENCY PLAN & ENVIRONMENTAL MANAGEMENT PLAN** successfully during the year 2006-07 & most of the employees are trained under this plan to overcome the emergencies on day to day workings.

There has been no incidence of accidents from past 3 years. The ETP has been expanded to treat the additional effluent flowing due to increased milk handling.

With the completion of Effluent treatment plant the treated water is being used efficiently for gardening purpose. The garden has sufficient greenery to achieve the eco-balance in the Dairy premises



BEST MAINTAINED GARDEN AT DAIRY PREMESIS - 2007-08