

Welcome to
the Presentation on

TOTAL ENERGY MANAGEMENT

ERNAKULAM DAIRY

General Information

- Started in 1989
- Capacity 1 Lakh LPD
- Storage capacity of 1.8 lakh Lts.
- Present handling about 1.95 Lakh LPD
- Expansion of plant to 2.00 Lakh LPD
under process

PRODUCTS

- Milk - 3 varieties
- Curd
- Butter
- Ghee

- Sambharam
- Ice Cream Mix
- Cream

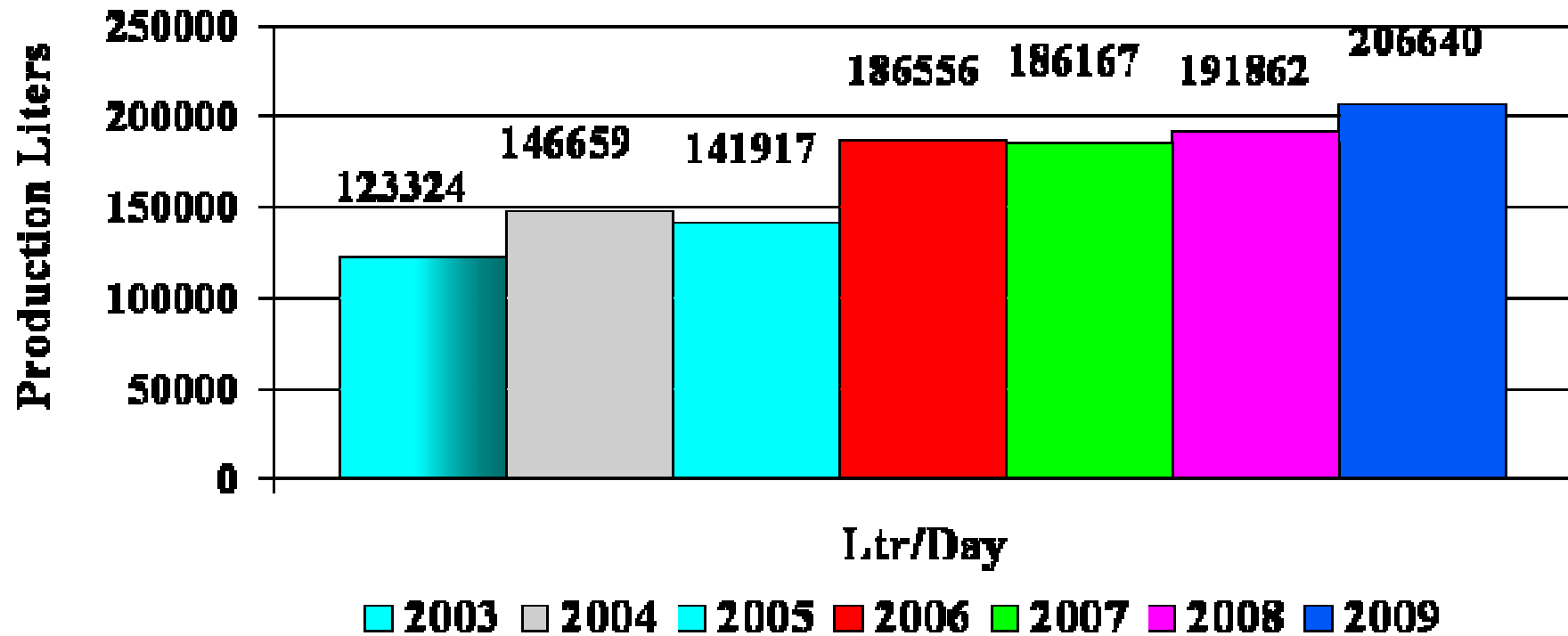
Present Production Capacity

- Milk :1,00,000 LPD
- Butter :700 Kgs in 2 shifts
- Ghee :1500 Kgs in 3 shifts
- Ice Cream Mix :440 lit in one shift
- Sambharam :10,000 Pkts
- Curd :12,000 pkts

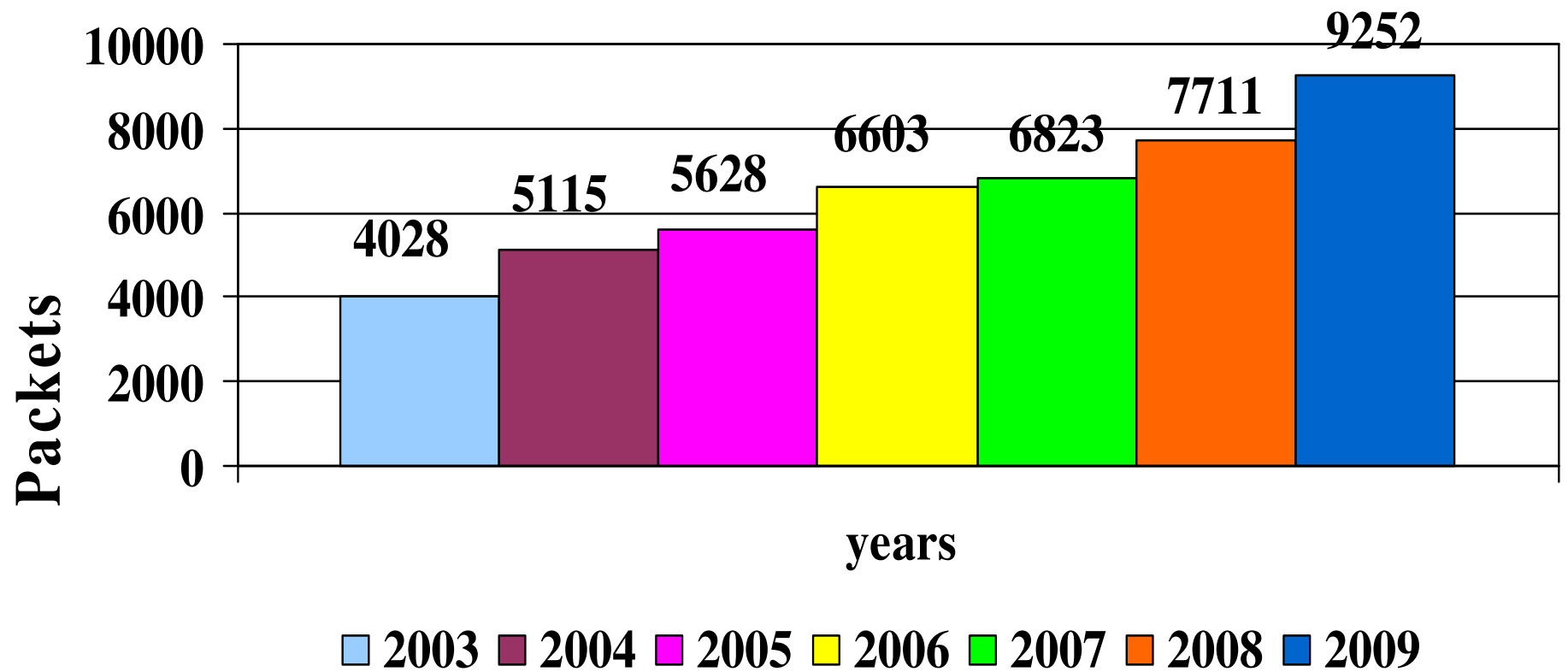
ENERGY POLICY & GOAL

- **Energy Policy** :- *Effective use of energy sources by adopting new energy efficient methods including eco-friendly technologies with an aim to continuously improve productivity and quality.*
- **Goal** :- *Produce safe and quality milk and milk products to supply at competitive price for consumer satisfaction aimed at Farmers' prosperity.*

Production Details – Milk LPD

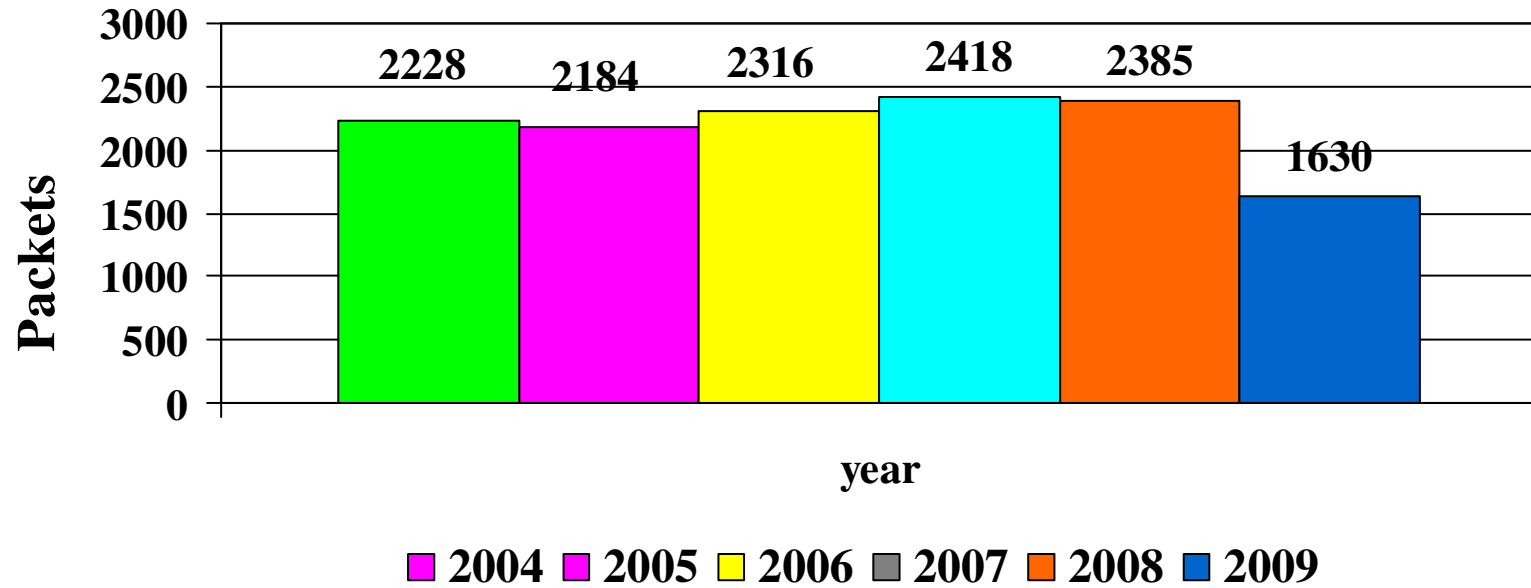


Production Details – Curd Packts/Day

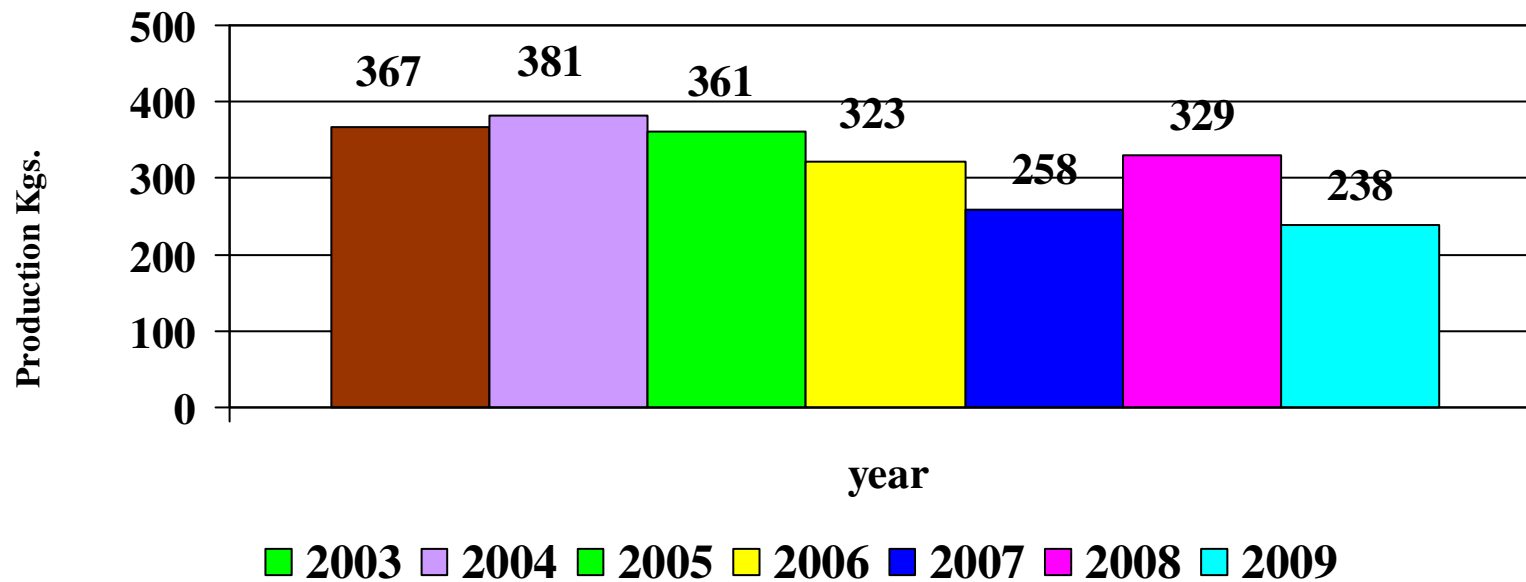


Production Details

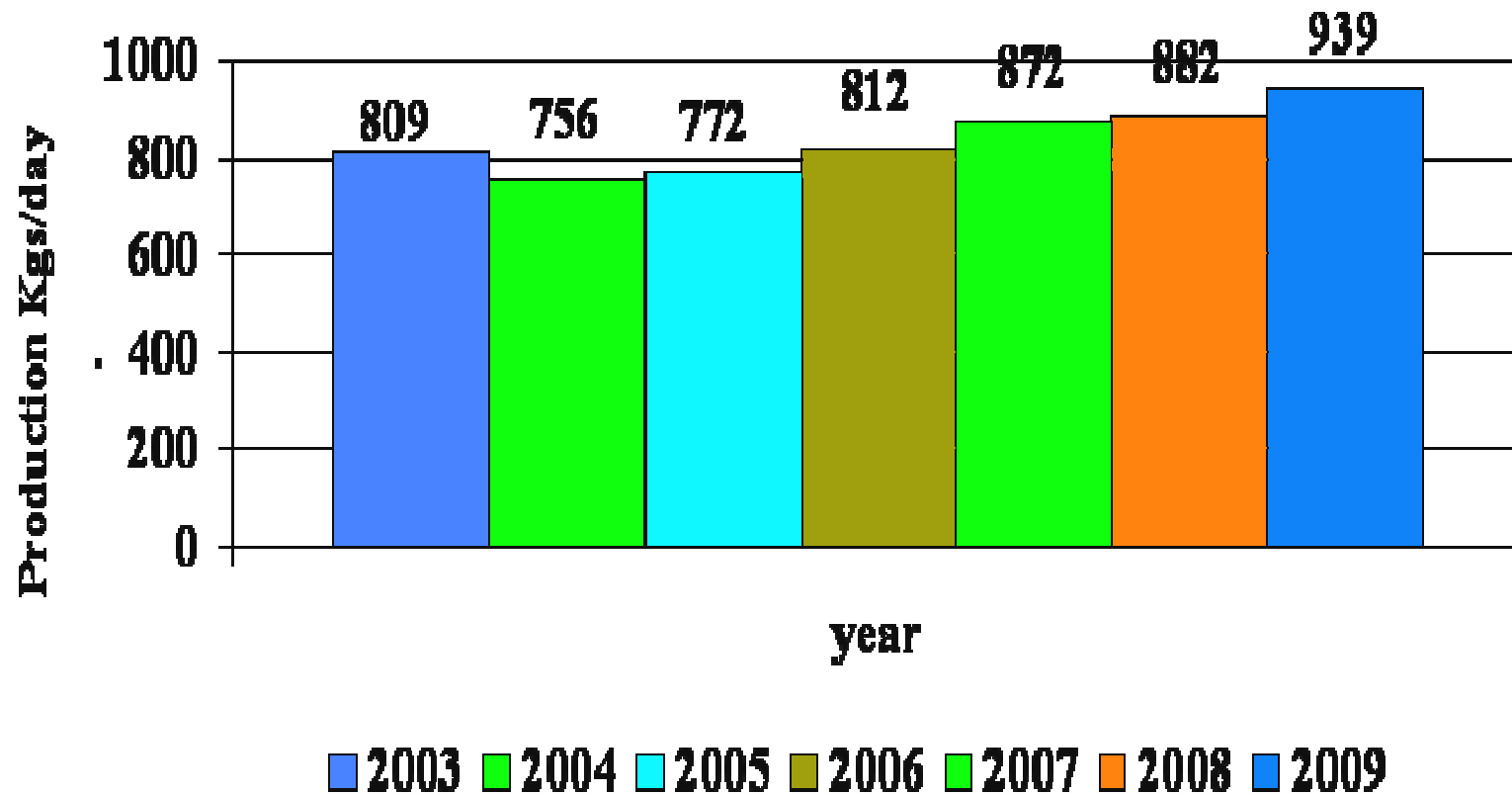
Sambaram Packts/Day



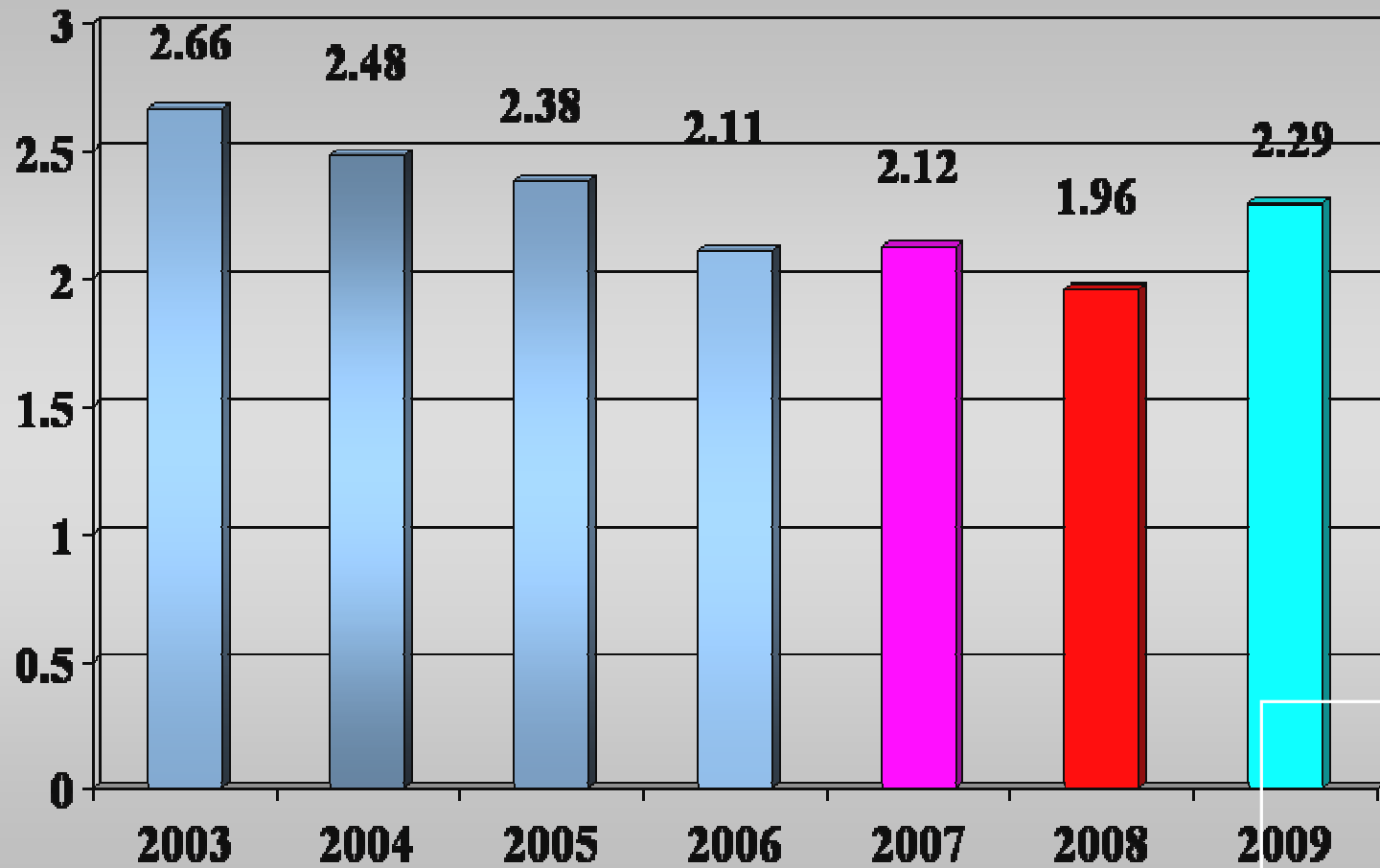
Production Details – Butter Kg/Day



Production Details – Ghee Kg/Day



Avg. Water consumption/litre of Milk



Water Consumption

- **The cost of Water was Rs. 9/ KL during 2005**
- **The present rate of water @ Rs. 25/KL from 2009**
- **The consumption of Water was in the ratio 1: 2.38 during 2005 and same was reduced to 1: 2.29 during 2009 by various action taken by us.**
- **The increase in consumption of water during 2009 is due to high rate of Reconstitution of milk.**

Activities undertaken during the period

- Installed a pneumatic valve in crate washer to control water flow.
- Water from ETP clarifier is used for gardening.
- Provide pneumatic valve in chiller to isolate chilled water when the chiller is not in operation.
- Installed automatic shut off valve in boiler service tank for maintaining required level of water.
- Replaced all frequently operated valves to Ball valves.

SAVINGS

Base value taken :- 2005 (2.38 lit of water per lit of milk processed)

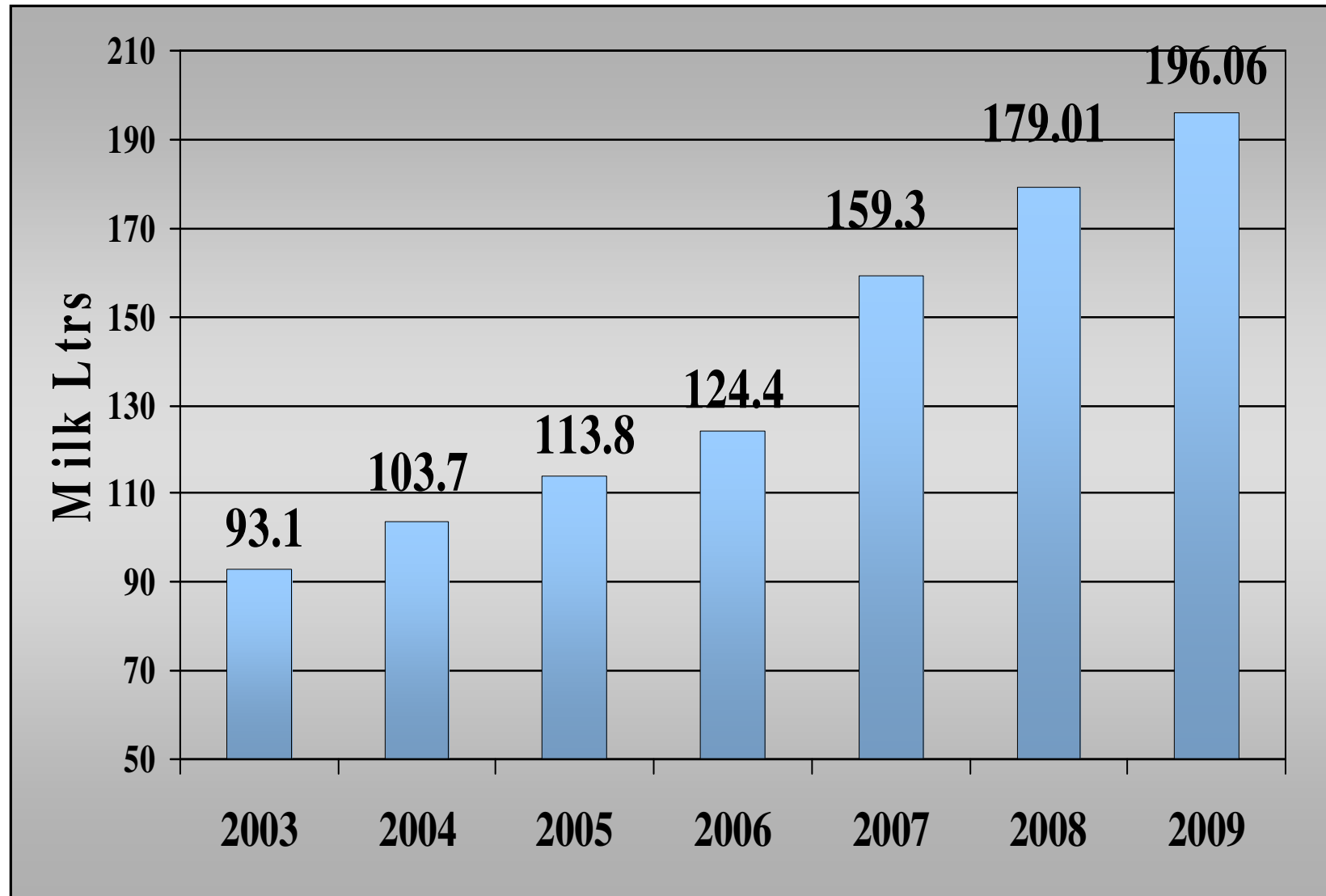
- Savings during 2006 is Rs.1,53,008/-
i.e. $56669745 \times 10 \times (2.38-2.11) / 1000$
- Savings during 2007 is Rs.1,65,646/-
i.e. $63710330 \times 10 \times (2.38-2.12) / 1000$
- Savings during 2008 is Rs.2,69,673/-
i.e. $64207899 \times 10 \times (2.38-1.96) / 1000$
- Savings during 2009 is Rs.1,78,727/-
i.e. $71490863 \times 10 \times (2.38-2.28) / 1000$

Our Target is 1: 2 Liters

Action Plan for next year

- **Rain water harvesting for the entire area of plant building**
- **Explore the possibility of using water from clarifier for cleaning trays and cast iron floor.**
- **Replacement of VST condenser to PHE type Condenser and high efficiency FRP Cooling Tower.**
- **Replacement of CIP system to Double circuit CIP system with high efficiency system.**
- **Replacement of Hot water system of 10 KLPH Old Pasteurizer**

Milk/Ltr of Furnace Oil (Avg.)



Furnace Oil Consumption

- **Our average Furnace Oil consumption during 2005 was 113.8 lts of Milk/Ltr of F. Oil and during 2009 increased to 196.06 of milk per lit of F.Oil**

We achieved by the following :

- 1. Steam leaks are arrested as and when detected**
- 2. Pasteurization Temp. reduced to 76°C from 78°C**
- 3. Tube cleaning of the boiler is done on regular basis**
- 4. Chimney and Duct cleaning is done on regular basis**
- 5. Condensate recovery. Collecting about 3,000 liters of hot water at 65° C and pumped to the boiler feed water tank.**
- 6. Replaced faulty steam traps.**
- 7. Provided Temperature Controller System in the CIP line.**

8. *One number new 20 KLPH pasteurizer (Tetra Pak) has been commissioned with higher rate of regeneration efficiency (90%).*
9. *Replaced ten numbers of leaky SS valves.*

SAVINGS - FURNACE OIL

Saving in F-Oil Consumption over Previous Year

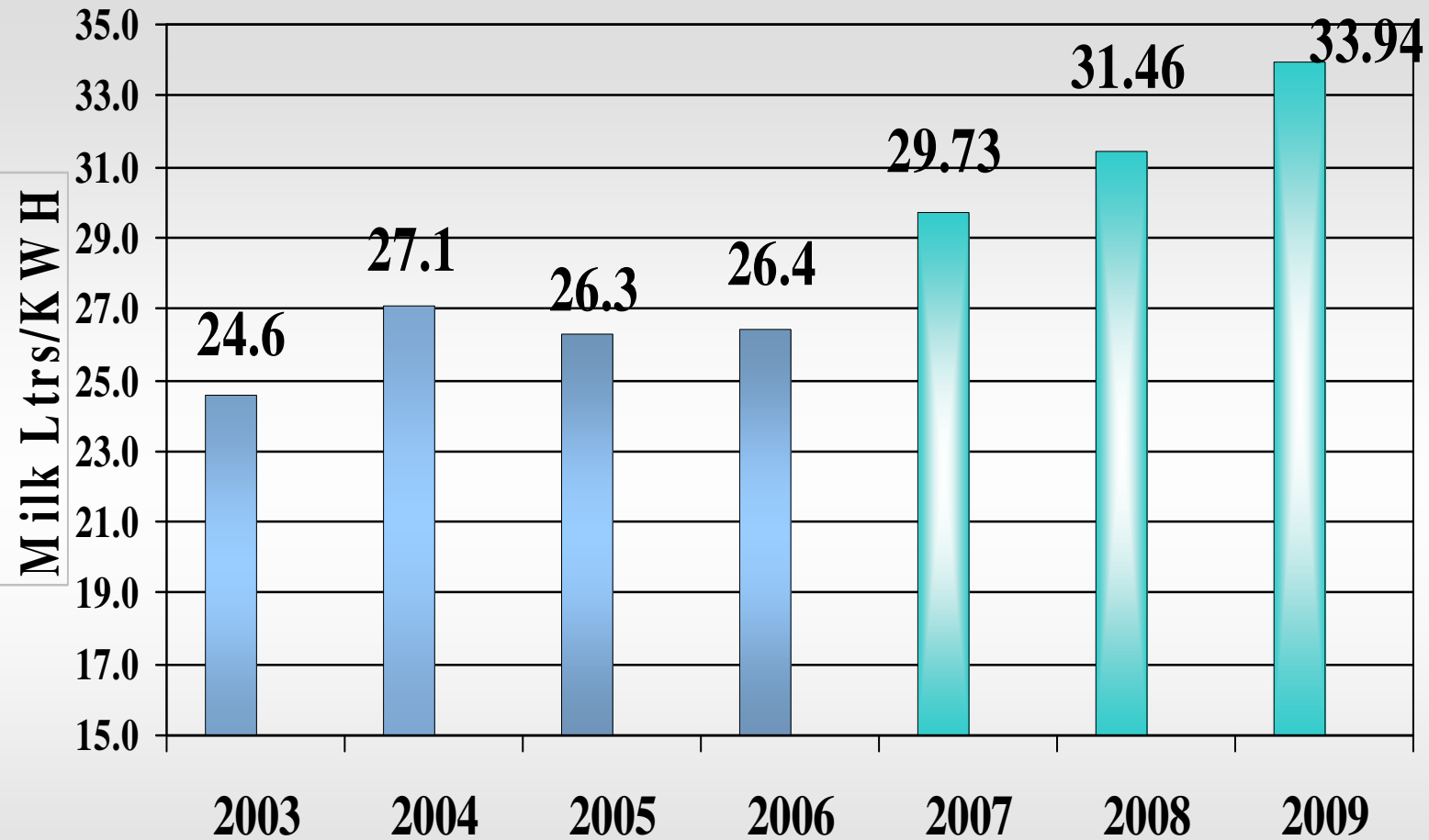
- Savings during 2006 is Rs.7,92,796/-
i.e.. $((56669745/113.8)-(56669745/124.49))*18.54$
- Savings during 2007 is Rs. 20,73,353/-
i.e.. $((63710330/124.49)-(63710330/159.30))*18.54$
- Savings during 2008 is Rs. 8,22,795/-
i.e.. $((64207899/159.3)-(64207899/179.01))*18.54$
- Savings during 2009 is Rs. 6,43,900/-
i.e.. $((71490863/179.01)-(71490863/196.06))*18.54$

Our Target is 200 Liters of Milk/ Ltrs. of Furnace Oil

Action Plan :-

1. Heat Recovery from Refrigeration compressor using De-super Heater. (Approx. Expenditure Rs. 12 Lakhs for generating 9,000 liters of hot water/day at 70°C)
2. Insulation of CIP Tanks to avoid heat loss (Approx. Expenditure Rs. 60,000/-)
3. Replacement of hot water system in Old 10 KLPH Pasteurizer.
4. Replacement of CIP system with tube in tube in heater instead of PHE type.
5. Replacement of one F.oil fired Boiler to Wood fired boiler.
6. Replacement of one F.oil fired Boiler to LNG fired boiler.
7. Installation Solar Water Heater and Desuper Heater for Boiler Feed water

Milk/KWH (Average)



Reasons for reduction in specific electricity consumption

- **Regulated Operation of Higher HP motors (Homogenizer and Ammonia Compressors) during Peak Hours. and availed incentives.**
- **Maintained Unity PF and availed incentives .**
- **Installed New Energy efficient Cream Separator.**
- **Installed New Energy efficient Homogenizer.**
- **Installed New 3 Nos. Mechanical Packing Machine.**
- **Replaced of under Loaded motor with suitable capacity motor in Butter Churn (20 Hp to 10 HP).**
- **Modified the Crate Conveyors drives and reduced one Motor (8 HP to 5 HP).**
- **Replaced 40 Nos H.P. sodium vapour lamps with 4 Nos of metal halide.**

- **Replaced all the Aerator Motors of ETP with new energy efficient Siemens make motors.**
- **Replaced fans of FDC in cold with energy efficient fans.**
- **Provided Automatic Control System with alarm for tanker unloading pumps.**
- **Provided Automatic Control System for circulation of water in the cream ripening tank .**
- **Provided automatic on-off system for RMRD can in-take conveyor.**
- **Provided Automatic Shut off valve in Chilled supply for Milk Chiller.**
- **Replaced 4 numbers of old rewind motors with new milk pumps.**

- **Replaced 2 Nos. 7.5 HP Condenser Pumps with 1 No. 10 HP Pump.**
- **Replaced 2 Nos. 7.5 HP FRP Cooling Pump with 1 No. 10 HP Cooling Pump.**
- **Provided Connection to Run only in Star for 20 HP Booster Compressor instead of Star-Delta Run.**
- **Replaced Cream separator with high efficiency separator (20 HP to 15 HP).**
- **Replaced Homogenizer with high efficiency Homogenizer (100 HP to 75 HP).**

SAVINGS - ELECTRICITY COST

Saving in Electrical Consumption over Previous Year

- Saving during 2006 :Rs. 2,10,998/-
i.e.. $((56669745/26.3)-(56669745/26.96))*4$
- Saving during 2007 :Rs. 8,80,713/-
i.e.. $((63710330/26.96)-(63710330/29.73))*4$
- Saving during 2008 :Rs. 4,75,051/-
i.e.. $((64207899/29.73)-(64207899/31.46))*4$
- Saving during 2009 :Rs.6,64,188/-
i.e.. $((71490863/31.46)-(71490863/33.94))*4$

Our Target :35 Liters of Milk /KWH

ELECTRICITY COST - ACTION PLAN (With Investment)

1. Heat Recovery from Refrigeration compressor using De-super Heater. There will be a power saving of about 100 KWH / Day
2. Replacement of re-wound motors with energy efficient motors in a phased manner.
3. Replacement of one No. New Energy efficient Cream Separator.
- Replacement of one No. New Energy efficient Homogenizer 20 KLPH.
3. Replacement of hot water system in Old 10 KLPH Pasteurizer.
4. Replacement of CIP system with tube in tube in heater instead of PHE type.
5. Replacement of one F.oil fired Boiler to Wood fired boiler.
6. Replacement of one F.oil fired Boiler to LNG fired boiler.
7. Installation Solar Water Heater for Boiler Feed water.
8. Replacement of VST Condenser with PHE type Condenser and more energy efficient FRP Cooling Tower.

Total Savings

YEAR	2006	2007	2008	2009
Water	1,53,008	1,65,646	2,69,673	1,78,727
F.Oil	7,92,796	20,73,353	8,22,795	6,43,900
Electricity	2,10,998	8,80,713	4,75,051	6,64,188
Total	11,56,802	31,19,712	15,67,519	14,86,815

ACTION Planed for 2010-11

	Action	Status
Refrigeration	Install de-super heater	Included in next year target
	Installation of PHE type condenser and FRP Cooling Tower	Included in Expansion

Name of section	Action	Status
Boiler/Steam	Insulate CIP tanks	Action initiated
	solar hot water and De super Heater system	We are planning to shift the solar water heating system from MCP Chalakkudy
	Conversion of F.Oil fired boiler to LNG fired boiler	After commissioning of LNG Terminal
	Replacement of CIP system with double circuit	Included in Expansion
	Replacement of 10 KLPH Pasteurizer hot water system and control panel	Included in Expansion

Name of of section	Action	Status
Electricals	Replace pneumatic packing machines with mech. m/c	6 Nos. mechanical packing machine installed this year
	Modification Old Past. Control Panel	Included in the Expansion 2010
	New PHE Condenser	Included in the Expansion 2010
	CIP New System	Included in the Expansion 2010

Name of section	Action	Status
Water Handling	Re-using of pouch filling machine head cooling water	2010-11
	Re-using of ETP treated 50% of water for plant cleaning	2010-11
	Rain water harvesting	Action initiated

Thanks.....