WELCOME TO THE PRESENTATION ON ENERGY CONSERVATION AND MANAGEMENT AT milma KANNUR DAIRY, KERALA
General Information

• Started in 1978 by Govt. of Kerala, Dept. of Dairy Development (KLD&MM Board)
• Capacity 10000 LPD
• Handed over to KCMMMF Ltd in 1984
• Expanded to 40,000 LPD in 1992
• Expanded to 70,000 LPD in 1998
• Expanded to 100,000 LPD in 2001
عنوان: ഭാഷാ താരതം

കേന്ദ്രം: മലയാളം ഭാഷാ താരതമ്യ സംഘടനയുടെ തലസ്ഥാനം 2006-07 മുതൽ വരെ താരതമ്യ സമാഹാരപ്രകാരം അനുസരിച്ച് പ്രവർത്തിച്ചിരുന്നു.

ആധിപത്യം: ആദ്യ ൽ സിനിമാ പഠന യൂണിവേഴ്‌സിറ്റി താഴ്വരയിലാണ് ആദ്യമായി നടത്തിയത്. മികച്ച ആദ്യാന്തിക സിനിമാ പഠന സമാഹാരത്തിന്റെ ആഴ്ചയാണ് തന്നെ.

2002 ൽ മലയാളം സിനിമയുടെ താരതമ്യ സംഘടനയുടെ സ്ഥാപനത്തിന് ആദ്യമായി ഏറ്റെടുക്കപ്പെട്ട് സിനിമാ പഠന യൂണിവേഴ്‌സിറ്റി. പ്രവർത്തിച്ചത്, പാഠ്യ കൌമിലാക്കണം എന്നതാണ് അനുസരിച്ച്. പാഠ്യക്കൗണ്ടേഴ്‌സ് മലയാള സിനിമയുടെ താരതമ്യ സംഘടനയുടെ വളരെ മികച്ച യൂണിവേഴ്‌സിറ്റി.
General Information

Present production Capacity

- Liquid Milk (Sachet) : 1,15,000 LPD
- Curd (Sachet) : 12,000 kg/Day
- Bottled Ghee : 30 MT/Month
- Butter Milk : 10,000 Pouches/Day
Details of milk handled

MILK HANDLED

<table>
<thead>
<tr>
<th>Year</th>
<th>MILK PROCESSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>32,304,600</td>
</tr>
<tr>
<td>2006</td>
<td>35,642,726</td>
</tr>
<tr>
<td>2007</td>
<td>29,473,267</td>
</tr>
<tr>
<td>2008</td>
<td>40,371,007</td>
</tr>
<tr>
<td>2009</td>
<td>45,341,330</td>
</tr>
</tbody>
</table>
Consumption scenario

POWER CONSUMPTION

2005 | 2006 | 2007 | 2008 | 2009
---|---|---|---|---
1346340 | 1395692 | 1497036 | 1498980 | 1443343
RESULTS OF ENERGY CONSERVATION WORKS

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MILK PROCESSED</th>
<th>POWER CONSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>32394604</td>
<td>1346340</td>
</tr>
<tr>
<td>2006</td>
<td>35642722</td>
<td>1395692</td>
</tr>
<tr>
<td>2007</td>
<td>39473267</td>
<td>1497036</td>
</tr>
<tr>
<td>2008</td>
<td>40371907</td>
<td>1498980</td>
</tr>
<tr>
<td>2009</td>
<td>45341330</td>
<td>1443343</td>
</tr>
<tr>
<td>increase 2005-2009</td>
<td>28.5</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Breakdown of Electricity Consumption

- Refrigeration: 53%
- Process: 19%
- Water: 11%
- Lighting: 1%
- Compressed Air: 5%
- Boiler: 2%
- ETP: 9%
- 1%
Furnace Oil Consumption

FURNACE OIL CONSUMPTION

2005 2006 2007 2008 2009
FURNACE OIL CONSUMPTION

Milk - LTR / Ltr FO

<table>
<thead>
<tr>
<th>Year</th>
<th>LTR/FO</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>196.0</td>
</tr>
<tr>
<td>2007</td>
<td>200.7</td>
</tr>
<tr>
<td>2009</td>
<td>211.9</td>
</tr>
</tbody>
</table>
Kannur Dairy

» Energy conservation measures implemented

1. Two Nos. of pneumatic milk filling machines replaced with Nichrome make mechanical machines
3. Reduced steam Pressure settings at delivery end from 3.5kg/q.cm to 3 kg/sq.cm.

4. Provided metal Halide 70 Watts shatter proof lamp fittings in RMRD & Ghee melting, replacing 6 Nos of 36 Watts fluorescent tube fittings.
Energy Conservation activities completed during 2005-06

1. Replaced 2No pneumatically operated milk filling machines with mechanical type machines and thus reduced using of compressed air consumption @50m3/hr at 6 bar.

2. Installed low power consuming lighting systems (CFL and slim tubes) in plant. Also avoided using of artificial lighting where ever possible by utilizing natural light.

3. Replaced 7.5 HP Jet pump for pumping water from open well with 5 HP submersible pump without scarifying discharge
Energy Conservation activities completed during 2006 -07

1) Installed De-superheating system for recovery of heat from hot refrigerant in Refrigeration section.
   Saving obtained /year = Rs.3,12,417/-

2) Replaced old 5HP milk feed pump with 3hp pump having same flow rate in milk Pasteurizer.
   Saving obtained /year = Rs.18,468/-

3) Replaced 15 HP pump in Tray washing Machine with 2 pumps of 7.5 HP & 2 HP without compromising on jetting pressure, efficiency and production.
   Saving obtained /year = Rs.47,849/-

4) Replaced old 3HP Cream pump with new 1hp pump (Netzch-German Make) of same flow rate. Thus could able to reduce power consumption by 2 HP.
   Saving obtained /year = Rs.6,209/-
DE SUPER HEATER
ENERGY CONSERVATION ACTIVITIES COMPLETED DURING 2007-08
1) RAIN WATER HARVESTING

Installed rainwater harvesting system and thereby able to collect about 10kl water per day during rainy days. Could able to reduce operation of 3 hp x 2 no bore well pumps for 4hrs/day for about 45 days.

Calculation of saving:

a) Energy saving /year (1.73 x 400V x 2.8A x 0.93 x 2 no x 4Hrs x 45 days/1000 = 510 Units

Amount saved/year (Assuming electricity charges @ Rs.5.20 /unit) = 510 x 5.20 = Rs:2,652/-

b) Cost of water saved/day = 10 kl x Rs.25/kl = Rs.250/-

Saving /year (Rs.250/- x 45 days) = 11,250/-

Total saving/ year (a+b) = Rs.13,902/-
RAIN WATER HARVESTING SYSTEM
Our processing plant was having corrugated oval shaped asbestos roofing. For implementing HACCP, we had replaced the roofing. Instead of going for conventional RCC roofing, we have provided roofing with combination of galvalume sheets and transparent sheets in MS reinforcement, ensuring maximum utilization of natural light. Thus we could eliminate using of 27 numbers of 36 watts tube lights during day time.

Calculation of saving:

Energy saving/day = 9.72 Units \((36\text{ w}/1000 \times 27\text{No} \times 10\text{hrs})\)

\[
\text{Saving/year} = 9.72 \text{ Units} \times 350\text{days} \times \text{Rs.5.20/Unit} = \text{Rs.17,690/-}
\]
TRANSPARENT ROOFING
3) AIR COMPRESSOR MODIFICATION

We were operating a screw compressor of 30hp to pump water from 2 bore wells and for feeding to plant machineries. Compressed air at 5kg.cm\(^2\) pressure is required for water pumping where as plant requirement is at 4kg.cm\(^2\). The compressor was located about 75 meter away from the bore well and so we used to run the compressor at a set pressure of 8kg.cm\(^2\) giving allowance for line drops. This compressor was in operation for 16 hrs/day on load. It was drawing a full load current of 28Amps.

We have done the following improvements.

i) Introduced two number dedicated compressor pumps of 3hp rating, near to the bore wells for water pumping.

ii) Provided timers for cyclic operation of bore well pumps in intervals of 30 minutes, ensuring the previous delivery rate of 1,250 lph.
iii) Reduced the working pressure of screw compressor to 6kg.cm². As a result, the compressor operation has come down to 11 hrs/day on load. Also full load current became 25.5Amps.

**Calculation of saving:**

a) Power consumption /day of crew compressor before modification= 1.73 x 400volts x 28 amps x 0.91pf x 16 hrs/1000 = 282.11 kWh

b) Power consumption/day after modification= 1.73 x 400 volts x 25.5 amps x 0.91pf x 11 hrs/1000 = 176.64 kWh

c) Power consumption of both the bore well pumps/day = 1.73 x 400volts x 2.8amps x 0.93pf x 12 hrs x 2 No/1000 = 43.25 kWh

**Unit Saving/day = a - (b+c)= 62.22 kWh**

**Saving year = (62.22 kWh x Rs.5.20 x 350 days) = Rs.1,13,240/-**
COMPRESSOR PUMP FOR BOREWELL
## PRODUCTION-CONSUMPTION COMPARISON

<table>
<thead>
<tr>
<th></th>
<th>2005-06</th>
<th>2006-07</th>
<th>2007-08</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a) Milk Processed (kL)</strong></td>
<td>37,706.11</td>
<td>40,697.43</td>
<td>44,968.71</td>
</tr>
<tr>
<td><strong>% Difference</strong></td>
<td>+ 8%</td>
<td></td>
<td>+ 10%</td>
</tr>
<tr>
<td><strong>b) Electricity consumption (Lakh Units)</strong></td>
<td>13.51</td>
<td>14.29</td>
<td>15.28</td>
</tr>
<tr>
<td><strong>% Difference</strong></td>
<td></td>
<td>+ 6%</td>
<td>+ 7%</td>
</tr>
<tr>
<td><strong>c) Furnace Oil Consumption (kL)</strong></td>
<td>169.27</td>
<td>175.71</td>
<td>184.85</td>
</tr>
<tr>
<td><strong>% Difference</strong></td>
<td>+ 4%</td>
<td></td>
<td>+ 5%</td>
</tr>
</tbody>
</table>
MALABAR REGIONAL CO-OP. MILK PRODUCERS’ UNION LTD.

Energy Policy

We, “Milma” shall strive for continuous energy economizing through

- Monitoring closely & control consumption of various forms of energy through an effective EMS.
- Improved capacity utilization, bench marking
- Up gradation of process, technology & equipments
- Maximise the use of cheaper & easily available form of energy.
- Maximise the recovery of waste energy.
- Creating awareness among the employees of all levels.

27 July 2004

Managing Director
Kannur Dairy is having an energy management committee constituting the following members. Monthly meeting is conducted on first Tuesday of every month.

1. Vijayakumaran K.M (Dairy Manager)
2. Jayachandran (Asst. Manager Q.C)
4. Raguthaman. P (Engineer-Mechanical)
5. Remesh V Menon (Technical Supdt)
6. Devanandandan (Technician)
7. Raveendran.C (Technician, MRAC)
Problems identified

Compressed Air

• Pressure settings is high in Air compressors
• Air Leak
• Inefficient Compressors
Countermeasures

• Reduced Pressure settings from 10 kg/cm² to 8 kg/cm²
• Leakage test conducted and arrested all the leakage points.
• Placed order for Screw Air compressors for changing the inefficient reciprocating Compressors
Problems identified

• Hot water Over flow from Hot water set of Pasteurizer
Countermeasures

• The Overflow water from the Hot water set used in CIP hot water tank.
Results

• The steam consumption in the CIP system has reduced.
• Saving in furnace oil consumption – 6000 lts/ year
• Cost of Furnace oil saving Rs. 72,000 per year.
HTST PLANT

- Regeneration efficiency of Plant is 90%
- Pasteurisation temperature kept at 78 Deg C

Changes incorporated

- Pasteurisation temp is reduced to 76 Deg C
- It is practically found that further reduction in temp adversely reflects in keeping quality of milk.
Works in Hand

• Shell and tube heat exchanger for installation in Ammonia compressor discharge line is under fabrication. The Hot water @ 35 lpm at 60 deg C is intended to use in Tray washer to minimize steam consumption.

• Splash steam from boiler blow down as well as steam traps from main header is recognized as a heat source to preheat furnace oil. This will reduce the heating of FO by using Electric heaters. The design and fabrication is on the anvil.
Minor, but Worthy points

• Replaced Bibcocks with 15 mm JAISON Taps in Canteen and wash basins to reduce water consumption.
• Provided 11W CFL in place of fluorescent/incandescent lamps in all stair cases and passages.
• In process hall all 20 mm wash points were changed to 15 mm to reduce water as well as steam consumption.
This is only a beginning ......

THANK YOU