SAFE MILK PRODUCTION IN INDIA AS A STRATEGY FOR BETTER PRODUCER PRICE

A Journey from Quality to Safety
KULDEEP SHARMA
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I am Lakshmi and this is my story
The Situation

150 Billion Litres

75 Billion Litres

25 Billion
50 Billion

12.5
12.5
12.5
4
8.5
The Coops VLC Paradigm

- The collection gets done through VLC
- Enough of Extension service
- Directly from Producer farmer
- Pricing on Fat or TS basis
- Strict rules on timely delivery
- Volume based incentives
- Annual dividends in case of State cooperatives
- Payment made from daily to 10 days cycle
- Fair testing and weighing
The private VLC paradigm

- Controlled by Intermediaries
- Payment basis adhoc and depends upon demand supply
- Normally prices are below cooperatives as advances are given to farmers
- Linkages with networks for creating unsafe milk
- Payment on 10-13 days by deducting the advance and on adhoc basis
- Fat/SNF receipt negotiated and compromised
Lakshmi can not take things for granted

- Weather
- Cold chain
- Power Up time
- Farmer awareness
- Small and marginal farmers
- Dairy being a part time business and handled by her or elders at home
- The money earned is her pocket money and the milk kept is her health insurance for the family
What is the driver behind Quality Milk?

Value addition Off course!
## Indian Dairy Market

<table>
<thead>
<tr>
<th>Classification</th>
<th>Market size (Rs billion)</th>
<th>Branded market share (per cent)</th>
<th>Growth over next 3 years (per cent CAGR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data is as of 2012-13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall industry</td>
<td>3050 - 3100</td>
<td>60-65</td>
<td>13-15</td>
</tr>
<tr>
<td>Milk</td>
<td>1900-1930</td>
<td>85-90</td>
<td>11-12</td>
</tr>
<tr>
<td>Curd and yogurt</td>
<td>190-200</td>
<td>~10</td>
<td>18-20</td>
</tr>
<tr>
<td>Buttermilk and lassi</td>
<td>100-105</td>
<td>~5</td>
<td>15-17</td>
</tr>
<tr>
<td>Ghee</td>
<td>420-425</td>
<td>~10</td>
<td>14-16</td>
</tr>
<tr>
<td>Butter</td>
<td>110-115</td>
<td>15-20</td>
<td>15-17</td>
</tr>
<tr>
<td>Ice-cream</td>
<td>35-40</td>
<td>60-65</td>
<td>18-19</td>
</tr>
<tr>
<td>Cheese</td>
<td>45-50</td>
<td>85-90</td>
<td>18-19</td>
</tr>
<tr>
<td>Paneer</td>
<td>215-220</td>
<td>10-15</td>
<td>16-18</td>
</tr>
<tr>
<td>Dairy whiteners and creamers</td>
<td>23-25</td>
<td>90-95</td>
<td>~15</td>
</tr>
</tbody>
</table>

Source: Industry, CRISIL Research
Though the informal sector accounts for nearly half of the Indian milk market, value-added products account for 21% of the market’s overall value today.

Market value of Indian milk products, 2012-2013E
Billion Rupees

- Informal milk market: 2,507* (45%)
- Processed milk: 1,915 (34%)
- Ghee: 423
- Butter: 113
- Buttermilk and Lassi: 103
- Ice cream: 38
- Dairy whiteners: 24
- Cheese: 48
- Paneer: 195
- Curd and Yoghurt: 699 (13%)
- UHT Milk: 470 (8%)
- Total: 5,591

* Value is estimated assuming 25% price discount to processed milk
Source: CRISIL Research, Dairy & Milk Products Annual Review 2012-13

UHT formed a tiny fraction of the market in 2012, but has since been growing at ~35%

Value-added products with relatively high bacterial quality requirements
Value-added products with relatively low bacterial quality requirements
Processed milk (e.g. whole and toned)
Informal milk market (e.g. direct sales to local shops)
The value-added segment is expected to lead future growth in milk revenues.

**Growth forecasts for Indian milk market (processed milk only)**

*Billion Rupees*

<table>
<thead>
<tr>
<th>Category</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall market</td>
<td>14%</td>
</tr>
<tr>
<td>Value added (higher bacterial quality requirements)</td>
<td>18%</td>
</tr>
<tr>
<td>Value added (lower bacterial quality requirements)</td>
<td>15%</td>
</tr>
<tr>
<td>Processed milk (whole and toned)</td>
<td>12%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Value added</td>
<td>597 (19%)</td>
<td>688 (20%)</td>
<td>795 (20%)</td>
<td>916 (20%)</td>
</tr>
<tr>
<td>Processed milk</td>
<td>1,915 (62%)</td>
<td>2,135 (59%)</td>
<td>2,381 (59%)</td>
<td>2,655 (59%)</td>
</tr>
<tr>
<td>Value added</td>
<td>3,074</td>
<td>3,485</td>
<td>3,954</td>
<td>4,488</td>
</tr>
</tbody>
</table>

Source: CRISIL Research, Dairy & Milk Products Annual Review 2012-13
While milk used in value-added products must meet more stringent requirements, it also results in higher profit margins for dairies.

Quality considerations for milk used in value-added products

- **Fat and solid non fat (SNF) content**
  The SNF content is the protein, lactose and mineral content in milk. This determines the nutritive value of the milk, and ability to extract fat for cream and other products.

- **Bacterial count**
  Frequently measured using the Methylene Blue Reductase Test (MBRT); longer reagent elimination times correspond to lower bacterial counts.

- **Presence of adulterants**
  The presence of water, starch, glucose, formalin, urea and detergent reduce quality and can damage consumer health.

Overall margins for value-added products

- Liquid milk: 6%
- Ice cream: 14%
- Paneer: 11%
- Curds: 12%
- UHT (Ultra-high temperature pasteurized milk): 20%

Bacterial count (SPC) vs Value addition

- **SPC**:
  - Low
  - High

- **VA**:
  - Yogurt
  - Panir
  - Lassi Chhas
  - Fresh milk

- **High SPC**:
  - UHT milk
  - ESL Milk
  - Sterilised flavored milk
  - Specialised cheese
  - Edible Casein and WPC
  - SMP
  - Dairy whitener
  - Industrial Casein
  - Ghee

- **Low SPC**:
  - Fresh milk
Dairies’ ability to source higher quality, lower-bacteria milk can translate directly into higher margins

Product margin versus bacterial count for milk products

Each hour of extra MBRT time corresponds to a potential 4.5% increase in product margin

Source: CRISIL Research, Dairy & Milk Products Annual Review 2012-13; Dalberg Interviews and research
Synthesis: The highest-margin products are also the ones which are expected to see the most revenue growth

Profit margin versus expected growth

Source: CRISIL Research, Dairy & Milk Products Annual Review 2012-13; Suruchi Consultants
Developing a strong sourcing and chilling model is key to higher profits; even spending 2 hours at ambient temperature can triple milk’s bacterial count.

Influence of temperature on bacterial development in raw milk

Urbanization and Demand

The demand growth at 7% is to be met by production growth at 4.3%
Off course Demand-Supply Gap

SO WHAT FEEDS GREED?
What happens when 77 Billion liters of milk demand is to be met with 75 billion liters of milk?

Safe Milk Mission in India
## Evolving Quality Standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial load (Total Plate Count)</td>
<td>Max. 2 mio/ml at BMC Max. 3 mio/ml at factory dock</td>
</tr>
<tr>
<td>Antibiotic residues (Chloramphenicol, Beta lactam &amp; inhibitors test)</td>
<td>Negative</td>
</tr>
<tr>
<td>Aflatoxin M1</td>
<td>Max. 0.5 ppb</td>
</tr>
</tbody>
</table>
## Milk Tests to be performed

<table>
<thead>
<tr>
<th>Formaldehyde</th>
<th>Boric acid/Borax</th>
<th>Added fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>Carbonates</td>
<td>Mineral oil</td>
</tr>
<tr>
<td>Sugar</td>
<td>Ammonium salts</td>
<td>Aflatoxin M1 by Charm Rosa</td>
</tr>
<tr>
<td>Starch</td>
<td>Salt</td>
<td>Antibiotic Chloramphenicol by Charm Rosa</td>
</tr>
<tr>
<td>Dextrose</td>
<td>Detergent</td>
<td>Antibiotics Beta lactam by Charm Rosa</td>
</tr>
<tr>
<td>Maltodextrin</td>
<td>Urea/synthetic milk</td>
<td>Inhibition test (antibiotics) with Delvo test kit</td>
</tr>
</tbody>
</table>
Motivation through Incentives

- Bringing milk in time
- Fat linked SNF as a condition of acceptance
- Large volumes from one place
- No foreign additives
- Antibiotic free
- Clean utensils
- High fat to be treated separately
- Blocking of machines to print receipt if standards not met
- Daily payments
- Incentives on Cow milk in certain cases
Quality

Humanity

Safety
Two activities for safe milk

• National Milk Survey 2016 with FSSAI India as a Lead expert
• Awareness program for animal wellness at farmer level for safe milk covering
  – Animal shed and comfort
  – Feed storage
  – Hygiene in milk harvesting
  – Regulated usage of hormone, Antibiotics and foreign additives
  – Quality of milk produced
Co Branding of Animal welfare Collaterals and Training Programs with World Animal Protection Society United States
We thank all Lakshmi(s) from India for driving our safe milk mission