Milk Saver

Red A
Our Product
Consumer Problem

- Unprocessed milk can only be stored for 24 hours
- Rural farmers have to undersell to conglomerates, because unsold milk at market is lost product to the farmer
  - This doesn’t allow for product differentiation between low end and high end milk (buffalo milk vs. cow milk)
Our Market

India

Targeted Customers:
Wholesalers/Middlemen
- Collect milk from local sources
- Cream separator

Competition:
- Amul
- National Dairy Development Board

Guyana

Targeted Customers:
Rural Farmers
- 30,000 tonnes of fresh milk produced

Competition:
- 75% of milk consumption originates from imported powder
Our Product

- Exhaust Vent
- Scraper
- Spray Nozzle
- Temperature Sensor
- Drum
- Turntable
- Furnace
Our Product

- Insulation
- Fuel Input
- Throttle
## Development from Sketch Model

<table>
<thead>
<tr>
<th>Sketch Model</th>
<th>Mockup Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Brainstorm configuration of the final product</td>
<td>• Divide and build key components of milk dryer</td>
</tr>
<tr>
<td>• Individually test spraying and scraping techniques</td>
<td>• Test spraying and scraping components together in mockup assembly</td>
</tr>
<tr>
<td>• Test milk drying process</td>
<td>• Test continuous milk drying</td>
</tr>
</tbody>
</table>
Risk 1: Drum Design

<table>
<thead>
<tr>
<th>Product Attribute</th>
<th>Engineering Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide surface to dry milk</td>
<td>Dimensions allow for 8 gallons/hour</td>
</tr>
<tr>
<td>Maintain continuous drying</td>
<td>Cylindrical drum design allows for continuous rotary drying</td>
</tr>
</tbody>
</table>
## Risk 2: Heat Distribution

<table>
<thead>
<tr>
<th>Product Attribute</th>
<th>Engineering Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide accurate temperature control</td>
<td>Manual throttle maintains temperature at 140°C</td>
</tr>
<tr>
<td>Safe to use outdoors</td>
<td>Rocket stove-inspired design allows for use in windy conditions and insulation protects user</td>
</tr>
</tbody>
</table>
## Risk 3: Application

<table>
<thead>
<tr>
<th>Product Attribute</th>
<th>Engineering Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instantly dry the milk without burning or denaturing the proteins</td>
<td>Nozzle allows for even, thin distribution of milk that dries on contact</td>
</tr>
</tbody>
</table>
### Risk 4: Scraping

<table>
<thead>
<tr>
<th>Product Attribute</th>
<th>Engineering Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain continuous milk collection</td>
<td>Scraper held in contact allows for constant rotary scraping</td>
</tr>
</tbody>
</table>

![Image of scraping mechanism](image1.jpg)

![Image of scraping mechanism in action](image2.jpg)
Benchmarking

Food Dehydrator
• Dries liquids in very small amounts
• $20-40

Cream Separator
• Used by farmers already but cannot dry milk
• $15

Milk Saver
• Dries 8 gal milk/hr
• Retail price: $40
• Production cost: $20
## Moving Forward

<table>
<thead>
<tr>
<th>Outstanding Risk</th>
<th>Engineering Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve scraping the milk</td>
<td>Requires more force and sharper edge</td>
</tr>
<tr>
<td>Improve the temperature control</td>
<td>Use a flue and a thermometer to control drum temperature</td>
</tr>
</tbody>
</table>
Special Thanks

For providing us with invaluable market insight we would like to give a special thanks to...

• Dr. Pradip Sarmah
• Candace Wilson
• Conrad Wilson
• Arka Dhar
• Azamat Abdymomunov
• Jose Gomez-Marquez