To create a sustainable method of yogurt production while minimizing design criteria.

**BACKGROUND**
- According to Health.gov, 75% of people don’t meet the daily dairy requirements.
- Current industry is predominantly run by a few big name brands.
- Increased interest in local manufacturers.

**UNIT OPERATIONS & OPT. CRITERIA**

<table>
<thead>
<tr>
<th>Unit Operation</th>
<th>Optimization Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasteurization</td>
<td>Pressure &amp; Time</td>
</tr>
<tr>
<td>Homogenization</td>
<td>Pressure &amp; Gap Size</td>
</tr>
<tr>
<td>Fermentation</td>
<td>Time &amp; Temperature</td>
</tr>
<tr>
<td>Cooling</td>
<td>Temperature</td>
</tr>
</tbody>
</table>

**EVALUATION OF ALTERNATIVES**

1. Milk: whole milk vs skim milk
2. Pasteurization: raw vs pre-pasteurized
3. Fermentation: unsterred with temperature control vs without temperature control, varying duration of fermentation process, varying target pH
4. Cooling: cooling tunnel vs storing in fridge room

**CONTRASTS & DECISION MAKING**

1. Cost: this process will recycle heat from the cooling to the pasteurization step.
2. Nutrition: vitamin concentrations will vary
3. Taste: different variables (pH, fat globule size, etc…) impact the product quality

**PRODUCT EXPERIMENT**

**Product Composition:**
Serving Size 1 cup (7.9 oz)
Ingredients Used:
- whole milk
- commercial yogurt with live active cultures

**ECONOMIC ANALYSIS**

<table>
<thead>
<tr>
<th>Yearly Production</th>
<th>Total Capital Investment</th>
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<tbody>
<tr>
<td>1113 batches/year</td>
<td>$486,316.81</td>
</tr>
</tbody>
</table>

**RECOMMENDATIONS**

- Test quality with different types of milk
- Experiment by adding different flavors or fruits


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