Optimized Manufacturing with Microorganisms

BACKGROUND:

Launched 2010:
- 9 Formulas
- 18 skus
- 2 Year Shelf Life
- Seasonal Business – March to September
- FY11 Rework ~ $300k

CURRENT CONDITION:

Manufactured and packaged at separate locations
- Minimum Run Size – 20k lbs.
- PLT = 5.2 Weeks
- PT = 10.8 hours
- Expired product returned for rework at Sanctuary
- Inventory ~ 1.1M lbs. at Dysart
- Est. FY12 returns = $240k

Problem Statement:
Currently carrying large quantity of inventory that has a two year shelf-life. Estimated cost for expired product next year $240k. Alternate options for manufacturing will need to be developed or the trend will continue in FY13 that will jeopardize the viability of the product line.

GOALS:

<table>
<thead>
<tr>
<th>Process Lead-time</th>
<th>Inventory</th>
<th>Run Size</th>
<th>Expired Product</th>
<th>Reduced Part #’s</th>
<th>Product Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2.5 weeks</td>
<td>110,000 lbs.</td>
<td>10,000 lbs.</td>
<td>$200,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>2013</td>
<td>2.5 weeks</td>
<td>10,000 lbs.</td>
<td>9 formulas</td>
<td>Variable</td>
<td>$50 / Ton</td>
</tr>
</tbody>
</table>
COUNTERMEASURES:

<table>
<thead>
<tr>
<th>Countermeasure</th>
<th>Effect</th>
<th>Cost</th>
<th>Feas.</th>
<th>Impact</th>
<th>Risk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Implement Just-In-Time Manufacturing</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>2. Add microbes during packaging</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>3. Combine man. and packaging</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>4. Reduce run size or raw material</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>5. Reduce formulation complexity</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>6. Remove microbes from formula.</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

FUTURE STATE MAP:

COUNTERMEASURE EVALUATION:

- Evaluate Options with Sanctuary: 4 mos. L. Conley, Thu 1/2/12 - Wed 6/12
- Develop Old Work for Forecasting: 3 wks. R. Radabaugh, Team, Thu 5/12 - Wed 6/12
- Evaluate Options with Detail: 4 mos. C. Wills, Thu 6/12 - Wed 9/12
- Evaluate options with Tissue Pack: 3 mos. L. Conley, Mon 7/12 - Fri 9/12
- Evaluate Stability of Microbes: 24 mos. R. Radabaugh, Mon 1/2012 Fri 4/12
- Temperature monitoring in facilities: 6 mos. P. Norby, Mon 2/12 - Fri 4/12
- Evaluate perfect storage condition: 3 mos. R. Radabaugh, Thu 3/12 - Wed 5/12
- Temperature/Time/Rest Time: 3 mos. R. Radabaugh, Thu 3/12 - Wed 5/12
- Evaluate Testing Options - ATL: 4 mos. B. Luske, Mon 2/12 - Fri 5/12
- Evaluate Re-Labeling Options: 2 mos. C. Wills, Mon 5/28/12 - Fri 7/12
- Conduct Cost Analysis for Tissue Pack Option: 1 mos. C. Wills, Mon 9/24/12 - Fri 10/12