### NMPF: Table 1
Processing Costs of Fluid Milk Plants by Size
September 23, 2003

<table>
<thead>
<tr>
<th>Monthly Volume (mil. lbs.)</th>
<th>0.09</th>
<th>2.0</th>
<th>5.0</th>
<th>12.0</th>
<th>18.0</th>
<th>30.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbein (FO 124)</td>
<td>1.080</td>
<td>0.671</td>
<td>0.631</td>
<td>0.591</td>
<td>0.509</td>
<td>0.468</td>
</tr>
<tr>
<td>Comell* (1997)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maine (2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maine (1994)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Plant Cost per Gallon

The graph illustrates the cost per gallon of processing fluid milk plants by size, with the following data points:

- **Herbein (FO 124)**
- **Maine (2001)**
- **Maine (1994)**
- **Comell* (1997)**

The equation for the graph is:

\[ y = 0.7733x^{-0.1338} \]
NMPF: Table 1A
Calculating Plant Cost Equation from Cornell results
September 23, 2003

Elasticity of plant costs/gal. with respect to plant volume, direct & indirect: -0.81

<table>
<thead>
<tr>
<th>Within range of study</th>
<th>Plant volume, mil. gal./mo.</th>
<th>Plant costs, $/gal.</th>
<th>Cost of producing gallon jug</th>
<th>Plant dep., $/gal.</th>
<th>Total plant costs, $/gal.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13.3</td>
<td>0.330</td>
<td>0.088</td>
<td>0.029</td>
<td>0.447</td>
</tr>
<tr>
<td></td>
<td>20.5</td>
<td>0.232</td>
<td>0.088</td>
<td>0.029</td>
<td>0.349</td>
</tr>
<tr>
<td></td>
<td>27.7</td>
<td>0.182</td>
<td>0.088</td>
<td>0.029</td>
<td>0.299</td>
</tr>
<tr>
<td></td>
<td>39.55</td>
<td>0.136</td>
<td>0.088</td>
<td>0.029</td>
<td>0.253</td>
</tr>
<tr>
<td></td>
<td>51.4</td>
<td>0.110</td>
<td>0.088</td>
<td>0.029</td>
<td>0.227</td>
</tr>
</tbody>
</table>

The mean "plant cost" per gallon in the study (18.2¢) was assigned to the mean plant size in the study (27.7 million lbs./mo.). Plant costs were then estimated using the study's elasticity of plant cost per gal. with respect to plant volume. Packaging and depreciation costs are taken as constant.

Cornell equation for "plant costs":
\[ \ln(COST) = B_0 + B_1 \ln(GAL) + ... \]
Equals:
\[ COST = (e^{B_0}) \times (GAL^{B_1}) \]
One point is:
\[ 0.182 = 2.682131 \times 27.7^{(-0.81)} \]
\[ e^{B_0} = 2.682131 \]
\[ B_0 = 0.986612 \]
NMPF: Table 1B
Calculating Plant Cost Equation from Herbein Survey
September 23, 2003

<table>
<thead>
<tr>
<th>Monthly Volume (mil. lbs.)</th>
<th>0.09</th>
<th>2.0</th>
<th>5.0</th>
<th>12.0</th>
<th>18.0</th>
<th>30.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbein (FO 124)</td>
<td>1.080</td>
<td>0.671</td>
<td>0.631</td>
<td>0.591</td>
<td>0.509</td>
<td>0.488</td>
</tr>
<tr>
<td>Monthly Volume (mil. lbs.)</td>
<td>0.09</td>
<td>2.0</td>
<td>5.0</td>
<td>12.0</td>
<td>18.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Herbein (FO 131)</td>
<td>1.008</td>
<td>0.629</td>
<td>0.592</td>
<td>0.555</td>
<td>0.477</td>
<td>0.458</td>
</tr>
</tbody>
</table>

Fluid Milk Plant Costs, F.O. 124
Estimating the Scale Effect

\[ y = 0.7733x^{0.1136} \]
\[ R^2 = 0.981 \]

Estimated Costs of Average Distributing Plants
Mil. lbs.

<table>
<thead>
<tr>
<th>Avg. pool dist. plants</th>
<th>/mo., avg. Cornell</th>
<th>Herbein (fitted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZ-LV</td>
<td>26.7</td>
<td>0.305</td>
</tr>
<tr>
<td>Pac NW</td>
<td>9.7</td>
<td>0.543</td>
</tr>
</tbody>
</table>
NMPF: Table 3
Cost Advantage of Producer-Handlers of Various Sizes
Relative to Average Pool Distributing Plant
Pacific Northwest Market
September 23, 2003

Herbein
Producer Handler
Monthly Volume (mil. lbs.) 0.09 2.0 5.0 12.0 18.0 30.0
Plant cost 1.080 0.671 0.631 0.591 0.509 0.488
Price advantage (Class I - blend) 0.143 0.143 0.143 0.143 0.143 0.143
Plant cost - price advantage 0.937 0.528 0.488 0.448 0.366 0.345

Average Pool Distributing Plant
Monthly Volume (mil. lbs.) 9.7 9.7 9.7 9.7 9.7 9.7
Plant cost (26.7 mil. lbs./mo.) 0.534 0.534 0.534 0.534 0.534 0.534
Producer Handler advantage (0.403) 0.006 0.046 0.086 0.168 0.189
Without price difference (0.546) (0.137) (0.097) (0.067) 0.025 0.046

Producer-Handler Advantage v Avg Pool Plant
Pacific Northwest, Herbein data

![Graph showing Producer-Handler advantage relative to average pool plant, with data points and lines indicating the advantage for different volumes.](chart.png)