**Introduction**

The traditional supply chain management goal of maximizing the profit while guaranteeing customer service levels is slowly changing. Improving the environmental performance has been identified as a method of increasing revenue and market share. Nevertheless, sustainability is rarely considered on the tactical planning level in the food industry in literature.

**Objective**

Integrate the environmental impact into the tactical planning model for the FMCG industry.

**Method**

Two objectives are included in the model: A cost minimization and an environmental impact minimization. The environmental impact is evaluated using the Eco-indicator 99 method. A set of Pareto optimal solutions is generated using the $\varepsilon$-constraint method.

**Case Study**

- Supply chain based in Europe
- Ice cream
- 52 weekly periods

**Environmental Impact**

**Ingredients**: Two options are considered for the two main ingredients of ice cream.

<table>
<thead>
<tr>
<th>Non-Organic Milk</th>
<th>Organic Milk</th>
<th>Beet Sugar</th>
<th>Cane Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.0</td>
<td>17.9</td>
<td>8.0</td>
<td>9.2</td>
</tr>
</tbody>
</table>

**Transport**: The environmental impact is approximated as 0.015 ECO 99 units/km based on a 40t truck with a 50% capacity load.[4]

**Results**

<table>
<thead>
<tr>
<th>Economic Costs [M€]</th>
<th>Ingredients</th>
<th>Transportation</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Minimum Costs</td>
<td>Minimum Impact</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1**: Supply chain

**Figure 2**: Trade-off between environmental impact and costs

**Figure 3**: Comparison of the environmental impact distribution for the minimum cost and minimum impact solutions.

**Conclusions**

- Environmental impact can be reduced by up to 6.3%
- Procurement provides main opportunity to reduce environmental impact

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