ERPsim Activity Four—Changing Bills of Materials, Production Improvements

You produce 6 products

- Wheat
- Nuts
- Blueberries
- Oats
- Dried raisin
- Strawberries

Muesli + Plastic bag + Cardboard box
Changing BOM

Product composition based on Bill of Material (BOM).

Factory can handle 6 different finished goods BOMs.

Product package size may be adjusted. Product formulations may be adjusted.

You will use the same finished goods material numbers, but modify their BOM to change the product.

Product formulations must conform to Muesli Industry Standards.

Muesli label regulations

<table>
<thead>
<tr>
<th>Labels</th>
<th>Wheat</th>
<th>Oats</th>
<th>Blueberries</th>
<th>Strawberries</th>
<th>Raisins</th>
<th>Nuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original</td>
<td>Min 20%</td>
<td>Min 30%</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Blueberries</td>
<td>Min 20%</td>
<td>Min 20%</td>
<td>Min 20%</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Strawberries</td>
<td>Min 20%</td>
<td>Min 20%</td>
<td>No</td>
<td>Min 20%</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Raisins</td>
<td>Min 20%</td>
<td>Min 20%</td>
<td>No</td>
<td>No</td>
<td>Min 20%</td>
<td>No</td>
</tr>
<tr>
<td>Nuts</td>
<td>Min 20%</td>
<td>Min 20%</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Min 20%</td>
</tr>
<tr>
<td>Mixed fruits</td>
<td>Min 20%</td>
<td>Min 20%</td>
<td>Min 30% (All fruits included)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 1.2: Muesli Manufacturing Association Label Regulation

*ERP Simulation Game, Participant’s Guide, Page 1-6*
Product Size

Changing Bill of Materials  ZCS02
**ERPsim Logistics**

Transaction ZCS02 for changing BOMs—same as standard SAP transaction except validity checks recipe before accepting.

Transaction will automatically modify the text name of your product based on formulation.

**You cannot change BOM for a product while existing products in that 'slot' are in stock.**

Sell out, adjust BOM, reforecast etc.

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**The demand from Customers**

Retailers order according to the needs of their customers. There is fluctuation in demand.

Customers have different preferences, each having a “preferred” recipes. Products closer to a customer's preferred recipe have an edge.

Advertising is persuasive, it can turn your recipe into the “preferred product.”

Price matters as there are things other than muesli to eat.
Setup time reduction

Between production runs plant shuts down for cleaning. Setup time reduction allows lowering that time.

<table>
<thead>
<tr>
<th>Setup time (hours)</th>
<th>Investment (euros)</th>
<th>Marginal investment (euros)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>13,157.89</td>
<td>–</td>
</tr>
<tr>
<td>11</td>
<td>22,777.78</td>
<td>14,619.88</td>
</tr>
<tr>
<td>10.5</td>
<td>44,117.65</td>
<td>16,239.67</td>
</tr>
<tr>
<td>10</td>
<td>62,500.00</td>
<td>18,382.35</td>
</tr>
<tr>
<td>9.5</td>
<td>83,333.33</td>
<td>20,833.33</td>
</tr>
<tr>
<td>9</td>
<td>107,142.86</td>
<td>23,809.52</td>
</tr>
<tr>
<td>8.5</td>
<td>134,615.38</td>
<td>27,472.53</td>
</tr>
<tr>
<td>8</td>
<td>168,606.67</td>
<td>31,958.34</td>
</tr>
<tr>
<td>7.5</td>
<td>204,545.45</td>
<td>37,878.79</td>
</tr>
</tbody>
</table>

ERP Simulation Game, Participant’s Guide, Page 1-16

Increase capacity

Your plant is capable of producing 21,000 units per day (regardless of BOM formulation).

You can make additional investments in your production equipment to increase the production capacity and reduce the setup time. For an investment of 100,000 euros you can increase production capacity by 400 boxes per day. Hence, an additional 1 million Euros will provide you with a total daily capacity of 25,000 boxes. You may invest additional money to increase your capacity at any time.

Total Daily Capacity = 21,000 + (0.004* Additional Machinery Investment)

ERP Simulation Game, Participant’s Guide, Page 1-15
Investment efficacy

Production improvements (capacity, setup time) begin with planned orders converted after the investment. Improvements continue in perpetuity and can also be accumulated.

Today’s Scenario

Team letter change
A → H
B → I
C → J
D → K
E → L
F → M
Today’s Scenario

Start from scratch. You have:

3 million EUR in cash
Production capacity of 21,000 units per day
No finished goods; no raw materials