Sustainability and cleaning: preparing for the future

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Experience
- 29 years with Diversey, started in Lever Industrial.
- Roles covering Global Strategic Accounts support, training, technical, applications and solutions support.
- EHEDG Executive Committee member, authorized trainer and chairman of Working Group CIP.

Education
- MSc Food Technology from University of Gent
- MBA Brussels

Who is Diversey

Who is EHEDG:
the European Hygienic Engineering and Design Group

- Stichting EHEDG - a Dutch “Institution for General Benefit”
- Founded 1989 as a non-profit consortium by the food industry for the food industry
- Funded by a growing number of strongly committed members

Our mission: EHEDG enables safe food production by providing guidance as an authority on hygienic engineering and design.
Who is EHEDG:
The European Hygienic Engineering and Design Group

The EHEDG members are:
- Equipment manufacturers
- Food industries
- Suppliers to the food industries
- Research institutes and universities
- Public health authorities and governmental organisations

The “Big 40” out of about 500 member companies worldwide

Main goal of the food industry:
- Profitability
- Brand image
- Consumer perception
- Quality
- Price

Raw material, Packaging, equipment & facilities, Hygienic design: a tool towards...
- Product innocuousness
- Cost saving
- Sustainable production

Hygiene

Environmental impact of hygiene-related activities

Environmental & Social commitment
- Materials costs
- Personnel costs
- Time
- C&D, environmental-related costs

Help Yourself to Happiness
Environmental impact of hygiene-related activities

Cleaning & disinfection

Water consumption. Some figures

- European food industry: 12% of total industry water consumption
- C&D: main water consuming operations in most food sectors
- Average water consumption in European industries:
  - Dairies: 0.33-12.6 l of water/kg milk for market milk (around 25-40% of the total water consumption is related with equipment sanitation processes)
  - Fish industry: 3-32 l/kg (around 10-50% related with equipment sanitation processes)
  - Fruit juices: 6.5 l/kg
  - Frozen vegetables: 5.0-10.5 l/kg
  - Meat processing: 3-5 l/kg

Waste water

- F&D sector: one of the main producers of wastewater
- Main pollutants: organic matter (as DOC, BOD), oils and fats, suspended solids, nitrate, chloride, phosphates, ammonium and nutrients as N and P
- Example: waste water discharge in market milk production: average of 2 liters per liter of raw milk processed

Energy and CO2 emissions

Hygienic design as an environmental impact reduction strategy

- Reduces soil accumulation
- Improves cleanability

Obvious!!, but …

Can we show it?

- lack of experimental and consistent data
Mechanical action and time

Example: effect of dead areas

Temperature

Temperature sensor installed in a T-piece (L = 2.6Ø). CIP temp of 85°C

Need for compensation!!
## Design and sustainability results

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Cleaning time (min)</th>
<th>Water savings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aseptic tank lid. Conventional</td>
<td>2.5</td>
<td>40</td>
</tr>
<tr>
<td>Aseptic tank lid. HD improved</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Static Spray Ball. Tank 7000 l</td>
<td>19</td>
<td>42</td>
</tr>
<tr>
<td>Rotary Spray Head. Tank 7000 l</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Eq. packaging disposal (inside). Conventional</td>
<td>10</td>
<td>75</td>
</tr>
<tr>
<td>Eq. packaging disposal (inside). HD improved</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Eq. packaging disposal (outside). Conventional</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Eq. packaging disposal (outside). HD improved</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Conveyor belt. Conventional</td>
<td>27</td>
<td>37</td>
</tr>
<tr>
<td>Conveyor belt. HD improved</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

- **Water consumption:** An overall average of 44% estimated savings in water consumption. For the dairy processing industry, the project tests achieved up to 50% savings and in the fish processing industry up to 28% savings were obtained;
- **Energy and CO2 emissions:** Dairies use 80% of their energy as thermal energy to generate steam and hot water from fossil fuels. An average 21-33% reduction in energy consumption was obtained, equating to a reduction of 20-49% of CO2 emissions; and
- **Wastewater:** The new designs reduced the quantity of sanitation chemicals used and the quantity of wastewater produced in volume. Overall, on average, wastewater was reduced by 36%.
**‘Green’ cleaning**

- **Definition**
  The use of cleaning products, tools, equipment and methods that protect the health of the end user, lower the total cost of cleaning, and prevent environmental damage

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**On chemistry**

**Responsible Chemistry Policy**
- Banned all alkylphenol ethoxylates since 2006
- Products that could present unacceptable risks are not approved for production.
- Products approved for sale must also meet local and global regulations, such as the Globally Harmonized System (GHS)
- A new range of plant-based, 100% biodegradable products

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**What is happening**

**Company goals**
- Achieve a Net Positive impact with products that eliminate waste, conserve energy, save water, and lower greenhouse gas emissions;
- Ensure that 100% of our packaging contributes to the circular economy;
- Have 100% of our innovations offer sustainability benefits greater than the solution they replace;
- Follow our Responsible Chemistry Policy to manage materials of concern in our formulas

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**Labeling**

- Green Seal
- EU Ecolabel
- MILJÖMÄRKET
On packaging

- Incorporating over 60% recycled paper board in our global cardboard packaging, saving 8.2M kg of wood fiber annually.
- Minimizing the amount of plastic in our bottles and canisters through light weighting, which reduces the amount of plastic used in production.
- Using recycled plastics in many of our bottles.
- Increasing chemical concentrations in our super concentrate products which avoids more than 170 million kg of plastic versus single-use, ready to use bottles on an annual basis.

Thanks

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