SUCCESSFUL APPLICATION OF UMBERTO IN FOOD AND BEVERAGE INDUSTRY

THE TASK

The corporate environmental balance for beer production at Neumarkter Lammsbräu brewery is set up to reveal optimization potentials. Material flow analysis can be used to determine all flows along the processes of beer production, and summarize consumption data. Emissions and wastes released in the production process are also of special concern. Neumarkter Lammsbräu has used the material flow management software Umberto as tool for this project.

STRATEGY AND IMPLEMENTATION

German Purity Law allows only barley, malt, hops, yeast and water to be used as ingredients in beer production. The beer brewing process is done in two steps: Preparation of malt from barley, and the actual brewing from malt, hops, yeast and water. Other materials are used in the filtration, bottle washing and sterilization processes.

With a detailed analysis all material flows used in the individual process steps are analysed and brought together for an evaluation of the complete production process under environmental aspects. In this context Umberto module libraries, which facilitate and support ecological evaluation material flows, are of great support. The corporate environmental balance starts with a detailed acquisition of particular consumption data of processing steps as malting, brewery and filling:

- **Malting**
  Malting begins with the feeding of corn and ends with temporary storage of the finished brewing malt. The water and energy flows in the processing steps reception, sorting, drying, storage, removal, steep, steep-out, malting box, kilning/hop drying and sterilization barley, are calculated from the Umberto model. For instance, the barley steep process requires around 25,000 litres of water per tonne of brew malt produced.
Brewery
The beer production is divided into the following steps: milling, mashing, refining, preparation of spices, knocking out, cooling, selected yeast, harvest yeast, fermentation, lagering and filtering. Again, the most relevant material flows are water and energy flows. One production day requires around 9,000 kWh of energy for power and heat generation.

Filling
This processing step starts with the preparation of new and used deposit bottles and ends with the storing of bottles packaged in crates on palettes. The individual processing steps are: Unwrapping of new bottles, unpacking of bottles, bottle washing, bottle control, filling, closure, labelling, crate washing, packaging and palletization.

A detailed Umberto analysis of the processing steps and the visualization of material flows show the main consumption data of the process. Optimization potential of the company is revealed. Future savings of materials and energy, waste prevention und reduction of water consumption can lead to ecological optimization within an environmentally conscious company.

High savings rate for diatomite
This mineral is used in the brewery as filter medium. The key agent of the fermentation process is yeast, which is crucial for diatomite consumption in the filtration. The use of a separate centrifuge can lead to a 70% reduction of total consumption of diatomite.

Preparation of the wash base with microfiltration machines
The base, which is classified as dangerous medium, is used in the bottle washing. Instead of disposing the base as hazardous waste it can be recycled through the application of microfiltration and biofiltration machines and then further used in the production process. Using the Umberto model has revealed a cost saving potential of around 125 € per tonne of base.

Impact evaluation of the corporate environmental balance comprises the categories resources consumption, green house effect, ozone depletion, photo-oxidants formation, acidification, eutrophication as well as human and ecological toxicity. Even at a company, such as Neumarker Lammsbräu, that is already oriented at a sustainable production process, further environmental improvement potentials can be disclosed as, for example, reuse of process water, purification of wastewater or use of the incidental process heat.

Dr. Ehrensperger, owner of Neumarker Lammsbräu

CUSTOMER TESTIMONIAL
„Even if you have already made your business environmentally conscious, you can further improve it! You don’t have to be afraid to take a closer look at all the particularities und details of various processes. A systematic and coordinated approach is vital. It’s only this way that a true insight is possible."

Thomas Weiß
Sustainability management representative for Neumarker Lammsbräu

EXAMPLES OF APPLICATION

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IMPROVEMENT POTENTIAL

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