

## Innovative Management Systems for sustainable Food Industry (IMSFood)

(CORNET)

<b>Coordination:</b>	Forschungskreis der Ernährungsindustrie e. V. (FEI), Bonn
<b>National Agencies:</b>	<ul style="list-style-type: none"> <li>• AiF - German Federation of Industrial Research Associations, Germany</li> <li>• IWT – Institute for the promotion of Innovation by Science and Technology, Flanders/Belgium</li> <li>• NKTH – National Office for Research and Technology, Hungary</li> </ul>
<b>Research Associations:</b>	<ul style="list-style-type: none"> <li>• CHOPRABISCO – Royal Belgian Association of the Biscuit, Chocolate, Pralines and Confectionary Manufacturers, Brussels/Belgium (Flanders)</li> <li>• FHFI – Federation of Hungarian Food Industries, Budapest/Hungary</li> <li>• FENAVIAN – Nationale federatie der fabrikanten van vleeswaren en vleeskonserven, Leest/Belgium (Flanders)</li> </ul>
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<b>Industrial Branch:</b>	Meat Industry
<b>Duration:</b>	2010 - 2011
<b>Volume:</b>	€ 700.000,-- (total)

### Initial Situation:

On a global food market cost significantly influence the competitiveness of food industry. For maintaining the long-term competitiveness it is important that the consumer benefits (quality, reliability) of the food products shall not be compromised, but lower prices shall be achieved by elimination or reduction of losses and wastes of time, material, human and other resources and through improvement of the efficiency of the whole food production and supply process.

There are several novel methods developed in the manufacturing sector for analysing the sources of the costs and identifying those activities in the process of the purchasing processing and supply, which do not add value

for the customers. However these methods were developed mostly for mass production in the manufacturing mainly for high-tech (car manufacturing, machinery, electronic appliances, IT hardware, pharmaceutical) industries, where high capacity, automatised production lines are producing large volumes, large batches of products, components, fixtures made of materials of relatively uniform quality and according to a limited number of designs. In these sectors the variation and choice of products is achieved mainly through the assembly of the modular elements. In the food industry there are significantly lower volumes of batches, with a much higher variation of compositions, recipes, products and processing techniques and the quality of the raw materials shows much higher

variation. Significant numbers of manual or less automatized operations are involved. Therefore the techniques developed by the manufacturing industry need to be adjusted to the needs, facilities and activities of the food industry SMEs.

The objective of the project was to develop practically applicable, efficiency increasing and cost reduction techniques, which are adjusted to specific conditions, facilities and resources of the SMEs working in the food chain. The project was aimed to develop a toolbox made of a set of practical methods tested in factory environment of a wide range of food industry, which can be adopted by a large number of food SMEs all over Europe to establish their specific solutions for cost reduction and efficiency increasing within their own businesses.

#### Research Results:

SusFood - the developed structured concept for a system for waste and losses identification is close to the HACCP system that guarantees legal requirements on food safety and was designed to prevent hazardous products from leaving the manufacturing or processing facility. HACCP is the main quality management system in food processing companies. The characteristic of it is that it follows a set of principles which end up in a list of steps to follow. The concept considers the production process step by step as well as the plants and facilities and involves the employees of various departments. The procedure to implement the HACCP system is proven and well-known in the food industry.

SusFood follows a similar approach but goes one step further. Instead of the food safety hazard the causes of the losses, waste and low efficiency can be identified with a structured approach. Before the cost reduction process can begin, ground rules must be established and agreed upon, so that both producer and supplier have the same clear understanding of the roles, responsibilities, and expectations regarding the process. These rules should explicitly address issues such as how to optimise the plant network, how to split the cost savings, how to equitably share investments, the criteria for approving improvement ideas and what resources will be needed. Once these rules have been defined to the satisfaction of both producer and supplier,

the cost reduction process can successfully proceed through three main project steps:

- Overall plant diagnostic, focused on setting a transparent baseline of the overall cost base and current plant performance as well as on sharing an early understanding of improvement opportunities and related backup analysis and observations (e.g., production flows, capacity bottleneck calculations, etc.).
- The development of improvement ideas, assessment of their implementation difficulty and the quantification of the related economic potential.
- Definition of the implementation plan, including roles, responsibilities and a finalized estimate of cost saving.

By using this system it will be possible to identify losses and waste of resources like energy, water, raw and packaging material. This results on the one hand in cost savings and in an increasing efficiency but also in the conservation of resources and offers food processing companies the opportunity to produce food with less impact on the environment.

In order to develop the system according to the needs and priorities of food processing companies the new knowledge was discussed, tested and adjusted through collective research by involving a large group of SMEs. The contribution and involvement of the SMEs was achieved through several workshops and working parties and through the performance of case studies and pilot projects.

For the practical application an industrial Best Practice Guide is developed. This Guide provides the description of the developed management system and includes a procedure for building up a waste analyses system and a tool for analysing the production flow. The reader can find short descriptions of some successful cases. The long version of the Best Practice Guide will be abbreviated and translated into national language so that it is more practical for the food SMEs.

#### Economic Value:

The level of R&D expenditures in the food industry is rather low compared to total manufacturing. However, the food industry (at least in some countries) is well known for the

high speed with which it implements basic innovations from other industries (like ICT, logistics, marketing). Therefore, the project, which aims to bring innovations from other industries to the food industry, is of high relevance. Further, it is argued that food SMEs often lack attention for training, has limited management-skills and limited access to the newest technology. Because of this, SMEs often have poor results in managing change and innovation.

The developed cost reduction and efficiency increasing techniques enabling SMEs to reduce their losses and wastes of time, material, human and other resources will lead to increased competitive advantage at food SMEs side. The project includes actions to have a tangible effect on cost reduction and efficiency increasing.

Today food processing companies have to fulfil the strong requirements of retail and consumers in terms of food safety and product quality. There is also a discussion in politics and society about resource saving and sustainability that leads more and more to market and consumer requirements. The developed management system for a sustainable food industry (SusFood) enables an analysis of the processes step by step and identifies area with resource saving potential. Improvements in these areas also lead to cost savings and an increase in efficiency.

The project results offer an innovative solution to fulfil the current and future requirements of the market and consumers and enable them to produce food with less impact on the environment. As demonstrated in the case studies and pilot projects there is a huge resource saving potential in the companies that can be used by only small investments or changes in the organisation of processes. For other improvements technical solutions are necessary. Therefore the project results will also lead to developments of innovative processes.

#### Publications (Choice):

1. FEI-Final Report 2011.
2. Dora, M.K. et al.: Operational performance and critical success factors for lean manufacturing in european food processing SMEs. Trends Food Sci. Technol. 31 (2), 156-164 (2013).

3. Dora, M.K. et al.: Food quality management system: reviewing assessment strategies and a feasibility study for european food small and medium-sized enterprises. Food Contr. 31 (2), 607-616 (2013).

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