



FOOD
MICRO
SYSTEMS

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Overall conclusions from the Microsystems for Food Roadmapping

Christophe Cotillon, ACTIA
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Overall conclusion

- Christophe COTILLON, ACTIA
 - Directeur adjoint, responsable projets européens



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- Olivier CHARTIER, Euroquality
 - Chef département agroalimentaire



RAPPEL

Challenge

Unite two remote areas

- ✓ Food
- ✓ Micro systems



How?

Promote cooperation between the two communities

3 application roadmaps
+ 1 technological roadmap

13 meetings

5 Reports
Needs of food industry
Potential of microsystems
+ consumer perception +
ethics + regulation

Five reports on the needs and constraints for implementing microsystems in the food sector

FoodMicroSystems covers the food and beverage sector. The European food and drink industry is an important pillar in the European economy, as one of the most successful and dynamic business sectors. As the largest manufacturing sector in Europe, the industry boasts an annual turnover of €965 billion, half of which is generated by small and medium-sized companies (SMEs).

The project looked at the different aspects that can influence the demands for microsystems in the food sector: the needs and constraints from the food industry, the regulatory context, the perception of the consumers and the ethical aspects. These aspects have been analyzed in five individual reports and in a synthesis report available for download below.

 [Synthesis report on the needs and constraints for implementing microsystems in the food sector.](#)

The main findings as well as the link to each individual reports are presented in a specific section of the website containing seven pages:

- Industry needs and demand: [page 1](#)
- Constraints for implementing microsystems : [page 2](#)
- Current regulations: [page 3](#)
- Consumer perception: [page 4](#)
- Ethical weighing of interests: [page 5](#)
- Synthesis: [page 6](#)
- Recommendations: [page 7](#)

Four reports on roadmapping

This section presents the roadmaps developed in FoodMicroSystems. Four reports are available: three roadmaps for the implementation of microsystems in the dairy, meat and beverage sectors and one final report that provides suggestions to address the technological needs in three areas (chemical and biochemical electronic sensors, microorganism detection and tracking & tracing systems). The section also provides links to the workshops organised to prepare the roadmaps:

- Dairy sector [this page](#)
- Meat sector: [page 2](#)
- Wine and beer sectors: [page 3](#)
- Synthesis of the roadmaps: [page 4](#)

You can easily navigate between the different reports with the menu at the end of each page.

Roadmapping in the Dairy sector

The economic importance of the dairy sector in Europe is underlined by more than 11.000 enterprises representing a total production value of more than 100 B€. Dairy is not only the largest segment of the food industry, it also represents 17% of the total European food export.

The reports provide a review of the supply chain and of the main drivers for innovation in the dairy sector as well as technology-to-application roadmaps for implementing MST-based solutions in several areas:

- Safety,
- Process and quality control,
- Cleaning and maintenance,
- Microfiltration.

[More information about workshops in the dairy sector](#)



26 April 2013, second roadmap workshop for the wine and beer sectors (France)

FoodMicroSystems organises its second roadmap workshop “Micro-technologies for the beverage industry – How can Micro technologies and Smart Sensors help the wine and beer sectors to improve quality and safety, and reduce processing costs” on the 11 March 2013 in

[Read more...](#)

25 April 2013, second roadmap workshop for the meat sector (France)

FoodMicroSystems organises its second roadmap workshop “Innovative Processes and Analysis Methods for the Meat Industry – How can Micro technologies and Smart Sensors help the Meat Industry to improve food quality, reduce cost, and strengthen consumer confidence?” on the

[Read more...](#)

11 March 2013, first roadmap workshop for the wine sector (Spain)

FoodMicroSystems organises its first roadmap workshop “Micro-technologies for the wine industry – How can Micro technologies and Smart Sensors help the wine sector to improve quality and safety, and reduce processing costs” on the 11 March 2013 in Barcelona (Spain).

[Read more...](#)

21 February 2013, first roadmap workshop for the meat industry (Estonia)

FoodMicroSystems organises its first roadmap workshop “Innovative Processes and Analysis Methods for the Meat Industry – How can Micro technologies and Smart Sensors help the Meat Industry to improve food quality, reduce cost, and strengthen consumer confidence?” on the 21

[Read more...](#)

Conclusions in 6 points (1/6)



The food sector is a significant market for developers of microsystems solutions

MST can help the food sector to address key challenges

There are strong needs for new solutions

Many examples in our reports

Conclusions in 6 points (2/6)



MST can stimulate innovation in the food sector

Applications of MST in the food sector will

Improve food safety and food

Enhance sustainability through better process control

Enable product innovations that benefit consumers and society.

Conclusions in 6 points (3/6)



Cross-sector collaboration should be stimulated to bridge the gap

The project identified problems to

- ✓ *Articulate food demands that can be solved by MST*
- ✓ *Express opportunities by technology companies that could benefit the food sector*

Conclusions in 6 points (4/6)



It is more about innovation than research

Important constraints for entering the food market

The solutions need to be part of the process management systems of the companies / the measurement per se is useless

To address these constraints, we need projects on innovation (including users in key positions)

Conclusions in 6 points (5/6)



Ambitious support programme is needed

- ✓ Price / cost is the most important factor
- ✓ We have a chicken and egg situation
Price depends on quantity, quantity depends on price

- => Support first successful applications
Example: rapid / cheap DNA test for horse meat

Conclusions in 6 points (6/6)



Horizon 2020 provides opportunities

ICT 2 – 2014: Smart System Integration

ICT 28 – 2015: Cross-cutting ICT KETs

SPIRE 1 – 2014: Integrated Process Control

It was the primary objective of FoodMicroSystems

Discussion



**Opportunities at national level ?
Uses of roadmap ?**

Details on H2020 opportunities

Opportunities in H2020

http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents

- ICT 2 – 2014: Smart System Integration
- ICT 28 – 2015: Cross-cutting ICT KETs
- SPIRE 1 – 2014: Integrated Process Control

ICT-2 (35 mln €)

- Research and development of application specific smart systems.
- Work will be driven by users-requirements and will target concrete solutions. It will exploit the convergence of key enabling technologies, focusing on the synergies between micronanoelectronics and biotechnologies.
- Work should develop along the full value chain and include validation of results in realistic environments and business cases.
- Relevant industrial supplier(s) in the addressed application(s) must be included in the consortium. Actions should include tests, end-of life and recyclability issues.
- Seized new opportunities in addressing societal challenges, e.g. in health, well-being, environment and food/beverage quality and safety.

ICT-28 (13 mln €)

- ICT-KET integrated platforms for the healthcare and food sectors: Further development and validation in real settings of reliable, low-cost micro-nano-bio and biophotonics systems driven by users.
- Actions should target the health sector for early or fast diagnosis or monitoring of disease and patient status (clinical trials are excluded) or the food sector for quality, safety and process control.
- They should include substantiated business cases for the targeted products with strong commitment to industrialise them in Europe.
- Wide market introduction of micro-nano-bio and bio-photonics systems for healthcare and food quality, safety and processing.

SPIRE 1 – 2014

- Process control of the industrial operations has a major role in assuring high quality standards and optimal operations in terms of resource use and economic viability.
- Technological progresses in this area that could allow measuring properties of process streams and final products, accurately and in real-time could represent a major step forward towards more reliable and sustainable industrial operations.
- These real time process data (e.g. chemical composition or biological contamination data) could allow the implementation of “near real time” closed-loop process control concepts making it possible to operate industrial processes at their optimum both economically and ecologically while ensuring high level of safety.
- To obtain real time process data, the development of reliable fast inline measurements will be fundamental. These measurements can easily be integrated into closed loop process control concepts, thus delivering the highest value and near real time process control for industrial operations and decision-making support tools.

Thank you for your attention !