

FOOD
MICRO
SYSTEMS

REPORT ON INFO DAYS

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FoodMicroSystems aims at initiating the implementation of microsystems & smart miniaturised systems in the food sector by improving cooperation between suppliers and users of microsystems for food/beverage quality and safety.

The project runs from September 2011 to November 2013, it involves nine partners and is coordinated by ACTIA (Association de Coordination Technique pour l'Industrie Agro Alimentaire, France). More information on the project can be found at <http://www.foodmicrosystems.eu>.

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1 Introduction

The FoodMicroSystems dissemination activities include a set of actions aimed at increasing the awareness of food industry in microsystems and the interest of the MST community in the food sector. It includes the organization of information campaign (direct emails to a mailing list of 411 contact details) as well as the organization of events designed for both the food community and the MST community.

This deliverable covers the activities targeted at the food community: it presents the activity implemented in France by ACTIA and EQY, in Germany by EnablingMNT and Fraunhofer and in Spain by the CSIC with details on the preparation of each event, their implementation and their results.

2 France 27th November 2013

2.1 Preparation of the event

First of all, the date and the place were determined by Actia and Euroquality in order to be able to attract a lot of stakeholders. The 27th of November allowed the FoodMicroSystems consortium to attract people interested in the European Horizon 2020 strategy who were coming in Paris for the 29th of November, to attend an information day of the French government about it. Actia's facilities were chosen to be the place to hold the info day because of its ideal situation in Paris city center. Actia took care of the logistical aspects of the organisation, such as room reservation, coffee break, and lunch.

Then the programme was set up by Actia, Actia/Adiv, Actia/Actalia, Euroquality, CSIC and CEA, and thought to be as interesting as possible for the audience. Therefore, it was decided to present the roadmap on the beverages, the one on the dairy products and the one on the meat products.

When the programme was ready, the graphic designer of Actia laid out a flyer advertising for the event, and Actia sent it to all the partners in order to have them disseminating it to their network.

All the partners sent invitation to their mailing lists, and the French partners took a special attention to the dissemination to their French network

In the meanwhile Euroquality created a webpage on the website gathering all the information about the event with a registration page linked to a database, in order to have an automatic registration. The flyer was included in the webpage as soon as it was done.

2.2 Implementation

Flyer:

**DEMI-JOURNÉE D'INFORMATION
SUR LES MICROSYSTÈMES, FRANCE
SÉMINAIRE**

Utilisation des microsystèmes en agro-alimentaire :
enjeux industriels, roadmaps technologiques

27 novembre 2013, à l'ACTIA, Paris, France
www.foodmicrosystems.eu // FoodMicroSystems est un projet financé
 par l'Union européenne (FP7/2007-2013) sous le grant agreement n° 287 634.

Coordinator **ACTIA**

Les microsystèmes pour l'industrie agro-alimentaire, tendances et applications

FoodMicroSystems est un projet financé par l'Union européenne depuis septembre 2011. Son objectif principal est d'amorcer la mise en place des microsystèmes et des systèmes miniaturisés intelligents en agro-alimentaire pour améliorer la qualité des aliments et des boissons, la maîtrise de leurs moyens de production et renforcer la confiance du consommateur ainsi que la sécurité des denrées alimentaires tout au long de la chaîne. Le séminaire fait partie des actions mises en œuvre pour améliorer la coopération entre les fournisseurs et les utilisateurs potentiels de microsystèmes en favorisant l'émergence de consortium entre industriels de l'agro-alimentaire et promoteurs de technologies intégrées. Les microsystèmes comprennent des capteurs autonomes, des systèmes d'acquisition et de gestion de grandeurs physiques, des outils de diagnostic, etc. Ils incluent éventuellement une phase de préparation des échantillons et peuvent détecter ou quantifier de nombreux paramètres (pression, accélération, humidité, température, dégâts physiques, agents chimiques ou bactériologiques, parasites minéraux ou biologiques...). S'ils sont bien mis en œuvre et rendus peu onéreux grâce aux procédés de fabrication de masse, ils peuvent accroître la compétitivité de l'industrie agro-alimentaire en proposant des capteurs, des filtres ou des structures miniatures réalisés sur des substrats de silicium ou des plastiques.

Demi-journée d'information « traçabilité, enjeux industriels et roadmaps technologiques »

Dans le cadre du projet et de ses actions de dissémination, cette journée d'information a pour but d'informer les experts du secteur agro-alimentaire et du secteur microsystèmes sur les résultats du projet, de créer des opportunités de développement de microsystèmes dans l'alimentaire et de rapprocher deux secteurs qui ne travaillent pas encore ensemble. Un des objectifs de ces nouvelles coopérations est de répondre conjointement aux appels à projets du nouveau programme de financement de l'Union européenne, Horizon 2020.

PROGRAMME

9h30
Accueil des participants

10h00
Présentation du projet FoodMicroSystems, Christophe Cotillon (ACTIA)

10h30
Roadmap MST pour le secteur vins et bières (D.4.4), Carles Cane (CSIC)

11h00
Roadmap MST pour les produits laitiers (D.4.2), Stéphane Gavoye (ACTALIA) et Elisabeth Delevoe (CEA)

11h30
Roadmap MST dans la filière viande (D.4.3), Matthieu Alric (ADIV) et Elisabeth Delevoe (CEA)

12h00
Discussion, synthèse avec les participants et les opportunités futures dans le programme HORIZON 2020, Christophe Cotillon et Olivier Chartier (EUROQUALITY)

13h00 à 14h30
Déjeuner - Buffet

INSCRIPTION

Le séminaire est gratuit, mais l'inscription est obligatoire. Elle se fait via notre site www.foodmicrosystems.eu. Si vous avez des questions, n'hésitez pas à contacter Christophe Cotillon (coordinateur du projet).

CONTACT

Christophe Cotillon
ACTIA
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Courriel : c.cotillon@actia-asso.eu
www.foodmicrosystems.eu

LIEU

ACTIA
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75005 Paris

COMMENT VENIR

EN MÉTRO
Ligne 7 arrêt Censier-Daubenton

EN BUS
Ligne 21 ou 27 arrêt Berthollet-Yvaoutin
Ligne 47 arrêt Censier-Daubenton
Ligne 91 arrêt Port-Royal-Berthollet

DEPUIS ORLY
RER C jusqu'à gare d'Austerlitz, puis bus 91 (direction gare Montparnasse)

DEPUIS ROISSY-CHARLES-DE-GAULLE
RER B direction Robinson ou St-Denis - les Charreuses jusqu'à Châtelet puis métro ligne 7

HÔTELS PROCHE DE L'ACTIA

SAINT-CHRISTOPHE HÔTEL
www.charm-hotel-paris.com

BEST WESTERN SÉROTEL LUTÈCE HÔTEL
www.hotellutecce.com

COMFORT HÔTEL CARDINAL RIVE GAUCHE
www.venera.com/fr/comfort-hotels/paris/hotel-cardinal-rive-gauche/

Agenda:

- 9h30** Welcome
- 10h00** Presentation of the project FoodMicroSystems: Christophe Cotillon (ACTIA)
- 10h30** Roadmap MST in the wine and beer sector (D.4.4): Carles Cane (CSIC)
- 11h00** Roadmap MST in the dairy sector (D.4.2): Stéphane Gavoye (ACTALIA) & Elisabeth Delevoe (CEA)
- 11h30** Roadmap MST in the meat sector (D.4.3): Matthieu Alric (ADIV) & Elisabeth Delevoe (CEA)
- 12h00** Discussion, synthesis with participants and future opportunities in HORIZON 2020: Christophe Cotillon & Olivier Chartier (EUROQUALITY)
- 13h00** Cocktail lunch

List of participants:

Last name	First name	Company/Organisation
Alric	Matthieu	Adiv
Avril	Sophie	CEA
Bauduin	Remi	IFPC
Bonnarme	Pascal	INRA, UMR GMPA
BORDES	Stephanie	MAAF/DGPAAT
Bourgade	Hélène	Euroquality
Bouyé	Clémentine	Tematys
Cane	Carles	CSIC-CNM
Chartier	Olivier	Euroquality
Cotillon	Christophe	Actia
Débias	Béatrice	ENIL
Delevoye	Elisabeth	CEA
Dulas	Alice	Actia
Gassie	Julia	MAAF/DGAL
Gavoye	Stéphane	Actialia
Giuliani	Laurence	Direction générale de l'alimentation / Sous-direction de la sécurité sanitaire des aliments / BETD
Guillemin	Herve	INRA
Guyot	Anne-Clothilde	Actia
Lacoste	Cécile	CTCPA
Lacotte	Pierre	Spectralys Innovation
Leduc	Tiphaine	MEITO
Mercier-Arrabal	Stéphanie	Institut Carnot Qualiment
Piat	Felix	Prestodia G
Picque	Daniel	INRA
Sartre	Pascal	MAAF/DGER
Werner	Dalal	Aérial

2.3 Results

The information day was quite successful and gathered 26 persons out of 30 registrations. The attendance was composed for one half of industrial coming from the microsystems and smart systems sector and for the other half of researchers of the food sector.



Each speaker first presented a summary of the needs of the concerned industry, to explain from where our results are coming, and then explained the outputs of the project, namely the roadmaps.



The CEA emphasized that the roadmaps are a valuable basis for setting up research or innovation collaborations between industrials or with national or European funding. This key message was well understood by the participants who were eager to know more about the following of the ICT European programme and more generally of the French and European funding for agri-food projects. It suggests that the FoodMicroSystems results will be well exploited.

3 Germany

3.1 Preparation of the event

A presentation including a discussion was given within a DLG-Workshop. The DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society) has over 20,000 members and is a leading organisation in the agricultural and food sectors. The DLG's mandate is to promote technical and scientific progress. With its projects and activities the DLG sets standards and provides impulses for progress. The DLG discusses, develops and communicates solutions for the future at over 120 conferences, seminars, workshops and congresses every year.

3.2 Implementation

Agenda:

DLG-Workshop „Instrumentelle Sinnessensorik in der Lebensmittelwirtschaft“
15. Oktober 2013 in Frankfurt am Main

Hintergrund

Die Humansensorik ist für die sensorische Qualitätsbeurteilung unabdingbar. Doch die Bedeutung der instrumentellen Sensorik mit den menschlichen Sinnen ähnelnden Technologien findet in Teilbereichen ergänzend und in Schnelltests immer häufiger Anwendung. Die instrumentelle Sensorik in Form von künstlichen Nasen, Zungen und Augen wächst insbesondere in den Anwendungsbereichen, in denen ein Bedarf an regelmäßigen, standardisierten, verlässlich-exakten und schnellen Analysen besteht. Dies betrifft u. a. die Bereiche Qualitätssicherung (Rohwaren, Zwischen- und Endprodukte) und auch z. T. die Produktentwicklung. Welche Angebote an „Instrumenteller Sinnessensorik“ gibt es am Markt? In welchen Bereichen finden diese Instrumente Einsatz? Welche Erfahrungen liegen bei den Anwendern in der Praxis vor? Welche Trends sind zu erwarten und welche Herausforderungen gilt es zu lösen?

Ziel des Workshops

ist es, den aktuellen Stand der Technik im Bereich der instrumentellen Sensorik seitens der Anbieter darzustellen und praktische Erfahrungen der Anwender zu diskutieren. Ein regelmäßiger Informations- und Erfahrungsaustausch zwischen Anbietern und Anwendern sowie der breiten Lebensmittelpraxis könnte die Weiterentwicklung und Anpassung an praktische Erfordernisse sowie den breiteren Einsatz dieser Technologie unterstützen.

Zielgruppen

Fach- und Führungskräfte aus der Lebensmittelbranche, die sich im Rahmen der Qualitätssicherung bzw. -überwachung oder Produktentwicklung mit Sensorik befassen und an den Möglichkeiten der instrumentellen Sensorik interessiert sind.

Programm

- 9:30 **Begrüßungs-Kaffee mit Foyerausstellung**
- 10:00 **Begrüßung**
Simone Schiller, DLG e. V., Frankfurt a. M.
- 10:15 **Elektronische Nasen: Status quo der Einsatzmöglichkeiten in der Ernährungswirtschaft**
Ergebnisse der Bachelorarbeit der Rheinischen Friedrich-Wilhelms-Universität Bonn und der DLG e. V.
Marie Müller von Blumencron, DLG e. V., Frankfurt a. M.

Technologien & Erfahrungen aus Anbietersicht

- 10:30 **Elektronische Nasen, Zungen und Augen – Überblick über Technologien und Anwendungsbereiche aus Sicht von Alpha MOS**
(Vortrag in englischer Sprache)
Sylvain Morel, Alpha MOS, Toulouse, Frankreich
- 11:30 **Intelligente chemische Sensoren für Industrie und Labor auf Basis von Sensorenarrays**
Dr. Andreas Walte, Airsense Analytics GmbH, Schwerin
- 12:00 **Mittagspause mit Foyerausstellung**

Praxisberichte aus Anwendersicht

- 13:00 **Schnelle Methoden zum Nachweis von Ebergeruch**
John-Erik Haugen, Nofima AS, Aas, Norwegen
- 13:30 **Kostengünstige Lebensmittelschnelltests mittels Sensorarray**
Dr. Mark Bücking, Fraunhofer Institut für Molekularbiologie und Angewandte Oekologie, Schmallingenberg
- 14:00 **SMart Nose® – Anwendungsbeispiele im Qualitätsmonitoring bei Obst, Getreide und Säften**
Dr. Daniel Baumgartner, Forschungsanstalt Agroscope Changins-Wädenswil ACW, Schweiz
- 14:30 **Kurze Kaffeepause**
- 14:45 **Diskussion im Plenum Chancen, Nutzen, Risiken, Kosten und zukünftige Herausforderungen für Anbieter und Nutzer**
Marie Müller von Blumencron, DLG e. V., Frankfurt a. M.
- 16:00 **Ende der Veranstaltung**

List of participants:

Name, Titel Vorname	Funktion, Betrieb, Institution, Organisation	Ort, Land
Anton, Lisa	DLG e.V.	Frankfurt am Main (D)
Boden, Ramona	Sachsenmilch Leppersdorf GmbH	Leppersdorf (D)
Bröll, Thomas	Rational AG	Landsberg a. Lech (D)
Brucker, Silke	SIG Combibloc GmbH	Linnich (D)
Büchner, Dipl.-Ing. (FH) Susanne	Labor Kneißler GmbH & Co.KG	Burglengenfeld (D)
Buckenhüskes, Prof. Dr. Herbert J.	DLG e.V.	Frankfurt am Main (D)
Conrad, Thorsten	3s GmbH	Saarbrücken (D)
Fähnle, Dr. Hansjörg		Geislingen (D)
Gebers, Nadine	DMK Deutsches Milchkontor GmbH	Bremen (D)
Kalitzki, Carolin	Partikant, Arla Foods Deutschland GmbH Niederlassung Pronsfeld	Pronsfeld (D)
Koch, Wolfgang	Harry-Brot GmbH Betrieb: Schneverdingen	Schneverdingen (D)
Krämer, Bettina	Arla Foods Deutschland GmbH Niederlassung Pronsfeld	Pronsfeld (D)
Kruse, Dr. Hans Peter	Universität Potsdam Institut für Ernährungswissenschaft	Nuthetal (D)
Lehrack, Dipl.-Ing. Annette	IGV Institut für Getreideverarbeitung GmbH	Nuthetal OT Bergholz-Rehbrücke (D)
Mackus, Christian	Wernsing Feinkost GmbH	Addrup-Essen (D)
Moritz, Dr. Angela	Rewe Zentral AG	Köln (D)
Müller von Blumencron, Marie	DLG e.V.	Frankfurt am Main (D)

Pabel, Dr. rer. nat. Bettina		Aschaffenburg (D)
Pichard, Elodie	DLG TestService GmbH Competence Center Food & Beverage	Gau-Bickelheim (D)
Sanders, Dr. Daniel	G.A.S. Gesellschaft für analytische Sensorsysteme mbH BioMedizinZentrum	Dortmund (D)
Schiller, Simone	Geschäftsführerin, DLG e.V.	Frankfurt am Main (D)
Schmidberger, Wolfgang	Rational AG	Landsberg a. Lech (D)
Waterkamp, J.	Leiter, Warsteiner Brauerei Haus Cramer KG	Warstein (D)
Wiech, Dr. Hans	CEO, VOCScan AG CAMOLEON Knowledge brokerage	Hamburg (D)
Wilcke, Britta	DLG TestService GmbH Competence Center Food & Beverage	Gau-Bickelheim (D)
Zeh, Dipl.-LM-Ing. Beate	Qualitätssicherung, Stollwerck GmbH	Köln Porz-Westhoven (D)

3.3 Results

Comments on the main achievements:

- Further developments are needed, e.g. the problem has to be well defined as well as the situation in which microsystems are needed.
- Individual solutions are requested, therefor numerous applications can be possible
- The measurement gets more challenging when the food matrix is getting more complex
- Very important can be the usage in food processing
- Manufacturer of these systems have to consider that devices should be suitability for daily use
- Forecast for the next 5 – 10 years:
 - Only those applications should be addressed, where microsystems can deliver a real solution
 - Money is needed for further developments
 - Devices will get smaller and smaller
 - Human senses will be “copied”
 - Combination of new technologies with well known techniques
 - Bioanalytical systems will increase

4 Spain

4.1 Preparation of the event

A dedicated event on “Challenges and Opportunities of Microsensors for the Food Industry” was organised by CSIC-CNM on the 7th of June, 2013 in Barcelona.

The organisation was carried out in collaboration with the GTQ-TECNIO Group of CSIC and with the Spanish Technology Transfer Agency ACCIO.

The aim was not only to present the opportunities of sensors, but mostly to show to the industrial attendees (most coming from food industries) results of projects, real implementations, visits to MST laboratories and microfabrication facilities in order to help the audience to clearly understand the technologies and their potentialities. Presentations were not only from Scientists but also from Industry.

The attendance of governmental authorities was also a good support for the event, as industrials also learned on funding tools for helping on the introduction of MST technologies in their processes and products.

4.2 Implementation

The next figure shows the programme of the event:

Jornada Microsensores: retos y oportunidades para la Industria Alimentaria
Viernes, 7 de junio del 2013 | IMS-CNM (CSIC)

Programa	
9:30	Recepción
9:35	Oportunidades de los Micro-sensores. Carlos Domínguez Co-Director del GTQ, IMS-CNM (CSIC)
9:45	Proyecto Europeo Food Microsensors: sensores para el campo alimentario. Luis Parada, Vicerrector del IMS-CNM (CSIC)
10:15	Retos en el control de alimentos/tecnología. Ignacio García Mora, Industrial Applications Manager, Galisa Blanco S&A
10:45	Pausa café
11:15	Microsensores: control de materia prima, de proceso y de calidad del producto final. Cecilia Jorriat, Co-Directora del GTQ, IMS-CNM (CSIC)
12:00	Tendencias: Detección rápida de microorganismos - Antoni Balcells, Investigador Senior del GTQ, IMS-CNM (CSIC)
12:30	Estrategias de ACCIO en la industria alimentaria - Ana Simón, Cap de Desenvolupament de TECNO, ACCIO
13:00	Cocharnada
13:15	Visita a Sola Blanca / Demostración en Microbotic
13:30	Apertivo networking

Logos: CSIC, CNM, FOOD MICRO SYSTEMS, gtq, TECNIO

The agenda was dedicated to the following main aspects:

- Opportunities of microsensors in the food area.
- Food Microsystems Project: Objectives and results.
- Challenges on food control and food technologies.
- Use of microsensors for raw material and process control and for the determination of the quality of end product.
- New tendencies: rapid detection of microorganisms
- Funding possibilities for the research of the food industry.
- Visits and demos in labs and clean room of CNM-CSIC.

List of participants from outside the FMS consortium:

List of participants:

Last name	First name	Company/Organisation
Abellán	Lorenzo	Central Quesera Montesinos
Abellán	Helio	Central Quesera Montesinos
Arenas	Lourdes	Quality Assurance ASG, SL
Asensio	Manuel	Damm, S.A.
Baldi	Toni	TECNIO GTQ-CSIC
Buffa	Martin	Planta Tecnología de Alimentos UAB
Castellari	Massimo	IRTA-Monells
Castillo	Manuel	CERPTA -UAB
Dominguez	Calos	TECNIO GTQ-CSIC
Dominguez	Manel	Grupo Danone
Gudiño	Manuel	Damm, S.A.
Jimenez	Cecilia	TECNIO GTQ-CSIC
Jiménez	Ricard	Fundacion Privada Ascamm
Marcos	Begonya	IRTA
Mínguez	Santiago	Institut Català de la Vinya i el Vi (INCAVI)
Moreno	Carlos	Maresmar
Navalón	Pedro	LABAQUA, S.A.
Oncins	Pep	Solfranc Tecnologies
Pardilla	Sandra	MATGAS 2000 AIE
Patricia	Patricia	MATGAS 2000 AIE
Payan	Esmeralda	Miguel Torres S.A.
Ribes	Eduard	I+D Sant Dalmai S.A.
Sabadell	Sonia	Hausmann
Vall	Pasqual	Aqualogy Soluciones Industriales
Vera	Ferran	D+T Microelectrónica AIE

4.3 Results

Interesting discussions were held after the presentations and during the wrap-up round table. The main conclusions were:

- There is a need of events like the one organised for increasing awareness of MST in the food sector.
- Visits to labs, clean room and demos were highly appreciated by the industrials.
- MST challenges are different depending on the food sector addressed.
- Agro Sector is also important and should be taken into account by the MST community in addition to food production.
- Not only food safety and end product quality is important but also the control of the whole food process.
- Simplicity of use, fast response and portability should be the objectives.
- Multi-parameter sensing with a single system is the goal.
- Instruments should be of medium to low cost, to compete with expensive laboratory analysis.