1st FooD-STA Virtual Conference

"University-Industry educational and training initiatives"

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FOREWORD (PAOLA PITTIA)

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EU frameworks programmes (eg. Europe 2020 strategic plan, the Lisbon agenda, the modernisation agenda of European Universities) have recently recognized the underpinning role of Higher Education Institutions in the transfer of knowledge to society and their vital contribution to Europe's economic competitiveness.

Academia has a key societal role in the development of research, the generation and transfer of knowledge, as well as in the training and education of highly skilled workforce including professionals, practitioners, employees and entrepreneurs at various levels and sectors.

Societal issues and economic constraints, however, are progressively leading a shift of the primary function of the universities, away from that mainly aimed to the formation of human resources and the advancement in knowledge, science and technology, towards a more societal- and business-oriented role and mission. In the last decades this has led university to the promotion and development of new initiatives along with training and research activities aimed to better contributing to the increase of the economic performances, employment, productivity and social cohesion. This is occurring not only in EU but it is a process, comprising the Higher Educational Institutions all over the world.

Actually, this concept is also well described in the "*Knowledge Triangle"* model that highlights the importance of an interplaying link and cooperation of the university, with its role in research and education, and business as ideal driver of knowledge-based economies and societies.

In this framework, various could be the cooperation activities that Universities and Industries may plan and develop to answer to the societal and economic needs. This has been mostly developed as joint collaborations in the area of research and innovation, while it has been explored and exploited only to a limited extent in the field of education despite its potential positive societal and economic impact.

Collaboration between university and industry/business in the field of education cannot be limited to a knowledge transfer, focused on cocreation of research outcomes or on student start-ups. Innovative types of collaboration need to be implemented providing increasingly recognized value for all stakeholders. This could be realized by the development of joint teaching and training activities that will require different levels of interactions, comprising simple student and staff exchange (including teachers and employees), but also bespoke course development, joint design of professional curricula and educational study programmes, continual professional development and lifelong learning, entrepreneurial education, and eventually and indirectly through spill-over effects.

The need of a closer interaction between the academia and industry - or, in a larger perspective, the business area - involves also the food sector with specific reference to the education in Food Science and Technology/Engineering disciplines, the food manufacturing sector and the food value chain.

The food system is currently challenged by ever-growing societal needs due to significant changes occurring at several levels (economy, society, technology, environment) that require increasing

investments in R&D along with proper actions able to promote innovation and to develop a sustainable and “knowledge-based” society.

Educational and training approaches and methodologies for the 2.0 young generation of food scientists and technologists need to be updated and upgraded to achieve a successful modernization of the HE Food Studies and enabling sustainable societal and economic growth.

However this requires the implementation of adequate academia-research-job market interactions and their improvement in a wider societal framework. This includes the involvement of policymakers and other stakeholders to promote the flow of knowledge and innovation as well as to design and develop adequate training of a modern workforce, equipped with the expertise and competences needed.

The recently ended FP7 Track_Fast (www.trackfast.eu) and Erasmus TN ISEKI_Food-4 (www.iseki-food4.eu) projects gathered information through questionnaires and surveys delivered to employers and employees of the food sector. The outcomes have highlighted the importance for a modernization of the current study programmes by the implementation of educational activities that allow to accomplish the job market needs in terms of technical/professional and soft skills. As regards the latter ones, it has been pointed out the growing relevance and role of soft or personal skills (transversal skills) including communication, problem solving critical thinking and foreign languages. Moreover, main outcome of the ISEKI_Food-4 project activities was that personal skills training needs to be developed by actions and tools embedded in the more “technical” disciplines and, more than this, in collaboration with the job market stakeholders thereby allowing a better qualification and enhancement of the professionalization at the end of the study programme.

Within the two projects it has been also pointed out that there is a rather diverse status of the university-industry collaboration in the food sector in the various EU countries as well as in the universities within a single EU country. This underlines the actual need to develop new tools and frameworks to support the potential collaborative activities between academia and business and to enlarge the societal and economic impact of such collaborations by relevant skills being developed and the conditions for future innovation and economic growth being set.

In recognition of the potential benefits that could be achieved by an increased cooperation between businesses and Higher Education Institutions in the field of education, the European Commission launched the Erasmus+ “Knowledge Alliance” initiative, to support the creation of new multidisciplinary curricula, promoting entrepreneurship within education as well as developing other transferable skills.

The European FooD-STA project is an ERASMUS+ Knowledge Alliance project aiming to establish an independent “EuFooD-STA Center”, a virtual platform with physical hubs, as a legal and organisational frame for international and sustainable collaborations between industry and academia in the food sector.

Within the various planned activities of the project, a virtual conference titled "University-Industry educational and training initiatives" has been organised with the aim to share best practices of university-industry educational and training initiatives for food study programmes and CPD (continual professional development). This conference was held as a public event, open to any interested party (industry, research, higher education institution participants) from all over the world. 32 oral and poster contributions have been presented during the two days of the event highlighting the growing interest to implement the academia-industry interaction via diverse tools and activities.

INTRODUCTION (GERHARD SCHLEINING)

Gerhard Schleining[1,2]

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European FooD-STA

European FooD Studies & Training Alliance

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This conference was organized by the **ERASMUS+ Knowledge Alliance** project **EuFooD-STA** project 554312-EPP-1-2014-1-AT-EPPKA2-KA**,** a knowledge alliance between **universities and food companies**. The event was carried out virtually using the online tool GotoWebinar© (http://www.gotomeeting.com/webinar).

It was announced worldwide via the ISEKI-Food Association to more than 9000 subscribers of the ISEKI-News. From 56 registered persons 43 participated from 19 countries (**Austria, Brazil, Canada, Estonia, France, Germany, Ireland, Italy, Lithuania, Malaysia, Mexico, Portugal, Romania, Slovakia, Spain, Sri Lanka, Switzerland, Turkey, United Kingdom**). From the 32 abstract submission 16 contributions were selected for oral presentations and the rest as posters.

The aim of this conference was to collect best practices of university-industry educational and training initiatives for food study programmes and CPD (continual professional development). Invited speakers from universities, industries and research presented perspectives of curriculum development, perspectives of companies and perspectives of research.

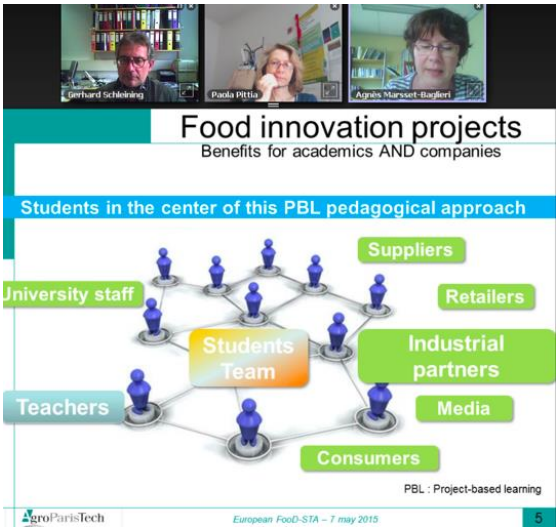
On the first day, after an introduction in the project and how to use the control panel of the web based conference by the coordinator of the project **Gerhard Schleining** (BOKU, Austria), mainly **prespectives of the universities** were presented and discussed.

Paola Pittia (University of Teramo, Italy) spoke about challanges and opportunities to innovative education and training in food science and technology.

Eduardo L. Cardoso (Escola Superior de Biotecnologia, Portugal) talked about promoting entrepreneurship trough University-Industry cooperation.

Ermis Ertan (Istanbul Sabahattin Zaim University, Turkey) reported the views of Food Engineering students on the effects of industry-integrated learning on employability.

Chathudina Janitha (Liyanage Sabaragamuwa University of Sri Lanka) talked about current and planned pedagogical initiatives for enhancing university-industry interactions and fostering entrepreneurial skills.



Romina Zanabria (Canadian Research Institute for Food Safety (CRIFS), University of Guelph, Canada) presented the "Loblaw Academy Case Study" and how to measure the e-Learning success.

Gwenola Bertoluci (AgroParisTech, France) gave an overview on the Food eco-innovation training: Idefi-Ecotrophelia.

Henry Eric Spinnler (AgroParisTech, France) presented the Savencia Academy, an example of long-term collaboration with Industry for lifelong learning.

Susanne Braun (University of Hohenheim, Germany) finished with an overview on research, training and Food Study Programms in Hohenheim.

The second day was dedicated more to **perspectives of research and industry**. **Brian McKenna** (University College Dublin, Ireland) gave some personal views based on experiences at UCD.

Maria Ana Marques (Frulact, Portugal), an industrial partner of the project, spoke about the opportunities for university-industry cooperation as key to continuous improvement.

Cristina L.M. Silva (Escola Superior de Biotecnologia, Portugal) reported on the advantages of pilot plant and cooking lab facilities for training and education. **Sadio Ramos** (Politécnico de Coimbra, Portugal) presented innovative pedagogical and learning experiences. **Giurgiulescu Liviu** (Technical University of Cluj Napoca, Romania) pointed out the differences between traditional and modern stimulation of creativity.

Victor Kuri (Plymouth University, UK) presented how academia could gain from Knowledge Transfer Partnerships between university and food SMEs.

Finally **Marc Dryer** (Nestlé, Switzerland) gave insight in the view from the R&D in the industry for talent development.

The programme, list of participants and all abstracts are available public at http://www.food-sta.eu/2015-05-07. The presentations and posters are available only for partners and members of the project after login.

There will be a continuation of collecting and discussing best practices in an "**open international forum**" at http://www.food-sta.eu for teachers, education scientists and industry representatives to promote a constructive dialogue and collaboration on university-industry educational and training initiatives, and to present and disseminate the results of the activities developed by the project and after. Everybody who registers on the website will be able to upload an abstract and supporting pdf documents and to discuss other contributions with the authors.

For further information please contact office@food-sta.eu.

AGENDA

Programme May 7, 2015

Day/Time	Speaker	Affiliation	Title
Thursday	Chairs: Gerhard Schleining, Paola Pittia		
15:00 CEST	Gerhard Schleining	BOKU - University of Natural Resources and Life Sciences, Vienna	Welcome, Introduction to EuFooD-STA and Instructions for participants
15:10	Paola Pittia	University of Teramo	Perspectives of Universities
15:30	Eduardo L. Cardoso, Marta Carvalhob	Escola Superior de Biotecnologia, Porto	Promoting entrepreneurship trough University-Industry cooperation
15:50	Ermis, Ertan	Istanbul Sabahattin Zaim University	Effects of industry-integrated learning on employability skill outcomes - views of Food Engineering students
16:10	Chathudina Janitha Liyanage	Sabaragamuwa University of Sri Lanka	Current and planned pedagogical initiatives for enhancing university-industry interactions and fostering entrepreneurial skills: a case study from Sabaragamuwa University of Sri Lanka
16:30	Zanabria, R., Lachowsky, W., Hill, A	Canadian Research Institute for Food Safety (CRIFS), University of Guelph, Department of Food Science	The Loblaw Academy Case Study: Measuring e-Learning success of a Training Program
16:50	Marsset Baglieri A., Bertoluci G, Lallmahomed A.	AgroParisTech	Food eco-innovation training: Idefi-Ecotrophelia
17:10	Henry Eric Spinnler, Michel Lavest, Martine Hautekiet, Vincent Jacquet, Maud Panouillé	AgroParisTech	Savencia Academy – An example of long-term collaboration with Industry for lifelong learning
17:30	Braun Susanne	University of Hohenheim	The University of Hohenheim: Overview on Research, Training and Food Study Programms
17:50	Paola Pittia	University of Teramo	Summary & Closing

Programme May 8, 2015

Date/Time	Speaker	Affiliation	Title
Friday	Chairs: Florence Dubois-Brissonnet, Cristina L. Silva		
10:00 CEST	Gerhard Schleining	BOKU - University of Natural Resources and Life Sciences, Vienna	Welcome and Instructions for participants
10:10	Brian McKenna	University College Dublin	Some personal views based on experiences at UCD
10:30	Pilar Morais, Maria Ana Marques, M. Helena Gomes	Frulact	Opportunities in HIE / Industry cooperation – the key to continuous improvement
10:50	Victor Kuri	Food and Nutrition, School of Biological Sciences, Plymouth University	Academic gains from Knowledge Transfer Partnerships between Plymouth University and food SMEs – An experiential learning taster for students and a business literacy degustation for academics
11:10	Cristina L.M. Silva, Marta Guimarães, Maria C.S. Hogg, Manuela Pintado	Escola Superior de Biotecnologia, Porto	Advances on pilot plant and cooking lab facilities for training and education
11:30	F. Sadio Ramos	Politécnico de Coimbra, Escola Superior de Educação	Innovative pedagogical and learning experiences
11:50	Giurgiulescu Liviu	Technical University of Cluj Napoca	Traditional versus modern in stimulation of creativity
12:10	Marc Dryer	Nestlé	Talent Development: the view from the R&D in the industry
12:30	Florence Dubois-Brissonnet, Cristina L. Silva		Summary & Closing

ABSTRACTS OF ORAL PRESENTATIONS

Challenges and Opportunities to innovate education and training in food science and technology (Paola Pittia)

Paola Pittia[1,2]

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Education has a main role in fostering innovation and in promoting economic development in all manufacturing sectors. This concept is also well described in the "*Knowledge Triangle"* model that highlights the importance of an interplaying link of education with research and innovation. Within this framework, academia plays a key role by educating graduates that during their professional career will become active players as professional, practitioners, employees and entrepreneurs in various roles in the food sector and by the development research and transfer of the new knowledge to the main stakeholders of the food value chain.

The food system is, however, challenged by ever-growing societal needs due to significant changes occurring at several levels (economy, society, technology, environment) that require increasing investments in R&D along with proper actions able to promote innovation and to develop a sustainable and "knowledge-based" society by including a modern education system to comply with the knowledge transfer and skills needed for the current and future workforce.

While educational and training approaches and methodologies for the 2.0 young generation need to be updated and upgraded a ssuccessful modernization of the HE food studies and enabling sustainable societal and economic growth require the implementation of adequate academia-research-job market interactions and their improvement in a wider societal framework also with the involvement of policymakers and other stakeholders to promote flow of knowledge and innovation.

The development of a constructive academia-industry interaction cannot be limited on a knowledge transfer focused on cooperation of research outcomes as well as on student start-ups. Innovative type of collaboration need to be implemented that provide increasingly-recognised value for stakeholders through more formalised student and staff mobility, curriculum development and delivery, governance and lifelong learning cooperation and indirectly through 'spill-over effects.

Enhancement of the educational approaches with an international, intercultural, intergenerational and interdisciplinary perspective should be also taken into account.

In the Food Science and Technology/Engineering sector, the ISEKI_Food network has promoted since 1998 continuous and diligent projects (e.g. FP7 Track_Fast, Erasmus TN ISEKI_Food) aimed on enhancing HE. These efforts involved a large number of representatives of main food supply chain stakeholders representing countries from all over the world. The just-ended project (ISEKI_Food 4, www.iseki-food4.eu), focused on modernization and upgrading food studies programmes, promoting employability and entrepreneurship of the graduated FS&T, and expanding lecturing qualifications of university teaching staff.

Savencia Academy: An example of long-term collaboration with industry for lifelong learning (Henry E. Spinnler)

Henry Eric Spinnler[1], Michel Lavest[2], Martine Hautekiet[2], Vincent Jacquet[2], Maud Panouillé[1]

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Savencia is an International group within the food industry focusing mainly on cheese manufacturing. Following contact made by Savensia, AgroParisTech developed a broad-based training program for its Management personnel. The objectives were to develop a program that would enable a common management culture globally within this group, and one that would foster interaction between management at different sites so as to mutually improve the base knowledge of scientific and technological skills in addition to contributing to team building within the group.

The training is organized and delivered over a three-year period. AgroParisTech is involved in the first year of training where the objectives are to refresh and provide current scientific knowledge associated with Dairy Technology. The company delivers the programs for the second and third years. Their focus is on areas of Good Manufacturing Practices (GMP), optimization of, and management of Production Tools and Product Specifications during the latter two years.

In coordination with the company, AgroParisTech has set up 3 modules that are delivered over 4 days, details as follows:

1) A module dedicated to the knowledge on milk, its fractions and the consequences of the structures on dairy products
2) A module dedicated to the microbiology of milk, fractions and end products including management of Food Safety, new knowledge on microbial ecosystems and the management of their functionalities
3) A module dedicated to Process Engineering and the key parameters for dairy processes with a session on Knowledge Management and System Modeling

The main objective of this program is to train all the Management staff at Savencia on an ongoing basis. As the staff to be trained are numerous, a number of sessions with 25 people per session (called Promotions) have been organized. All the staff trained and to be trained are involved in Management of Savencia, but with different initial skills and from a diversity of management functions.

Details of the program including the organization, animation / execution and cooperation with the company will be presented and discussed during this presentation.

Promoting entrepreneurship trough University-Industry cooperation (Eduardo L. Cardoso)

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Entrepreneurship has been considered, by different academics and policy makers, as a mean to foster economic development and job creation, but also as an ability to promote a more dynamic, creative, innovative, competitive and sustainable society.

Overcoming difficulties in the development of academic entrepreneurship are included in the required objectives of bridging the gap between research and innovation in Europe and, thus, is a challenge for universities. The prevailing forces have led these institutions to develop a “third mission”, the facilitation of technology transfer and activity in an entrepreneurial paradigm. In food science and technology, this issue could be argued to be more relevant as most businesses are small and medium companies, and there is evidence that effective university-industry collaboration needs “well-equipped” firms. Entrepreneurship can be considered as the process of creating new companies but also as the process of new business development in an existing organizational context. It has also been considered by academia as a useful technology transfer tool.

A case study was designed to describe and develop the relation and practices between a learning approach in a food science and technology educational program and a related business incubator.

The learning process benefited from the adoption of a structured framework methodology that led ideas and teams to business model generation and client development, in parallel, when possible, with an agile product/service development.

Although academic entrepreneurship engagement could be improved, this case study demonstrated that stronger skills development was needed to enable students and young researchers to be more aware of business development fundamentals and also of softskills, like wikiskills, and therefore contribute to the valorisation of individual knowledge assets. It was noted that the timing and format for involvement of companies in new business projects varied with their nature and maturity. The kind of exposure should as adequate to each contextual condition but it would be expected to promote not only a better incorporation of business needs but also a better awareness from the industry side, including the identification of the first potential clients for the knowledge produced by students and young researchers, time reduction to market, and to create much better conditions to support decisions about IP protection. This kind of formal approach could build the basis for a closer and earlier articulation between university and industry in educational and training programs.

Effects of industry-integrated learning on employability skill outcomes - views of Food Engineering students (Ermis Ertan)

Ermis Ertan[1]

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For many engineering undergraduate degree programmes, the opportunity to experience practical work (laboratory and manufacturing) in industry that supplement taught and practical subjects is valuable. Recently the close cooperation between higher education and industry is gaining importance as strengthening the links between both parties are considered essential to boost the economy and to enhance the quality of the workforce (Lock et al, 2009). Work integrated learning in higher education includes a joint effort by industry and higher education to enhance student learning through facilitating the application of theory into practice and is becoming increasingly significant to improve graduate employability by enhancing skill outcomes, such as team-work, communication, self-management, self-learning, analytical thinking, problem solving, and student employment prospects (Bates, 2011; Jackson, 2013)

In this study, it has been aimed to describe the benefits of implementing an alternative Cereal Processing Technology laboratory practical model for a group of third-year BSc Food Engineering students. This research assesses the student learning outcomes and gained experiences. Data were obtained from food engineering third-year undergraduate students who spent 3 work days (approximately 24 work hours) in a bread manufacturing factory's laboratory. Experiences and perceptions are gathered from 28 students by semi-structured interviews and attitude questionnaires have been conducted. The questionnaires were performed to describe the level of improvement in personal transferable skills (such as team-working, time-management, communication, learning and student understanding of the world-of-work), the value added in terms of improved technical skills students felt was gained and their perception of the practical laboratory work experience in terms of aspirations of future employment. Finally, this study identifies whether the undergraduates prefer practical laboratory work at an industrial environment as part of courses given at undergraduate level.

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Current and planned pedagogical initiatives for enhancing university-industry interactions and fostering entrepreneurial skills: a case study from Sabaragamuwa University of Sri Lanka (Chathudina J. Liyanage)

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The B.Sc. degree programme in Food Science and Technology at the Sabargamuwa University of Sri Lanka has been in existence since 1996. As the pioneering B.Sc. degree programme in that discipline in Sri Lanka, the curriculum integrates core aspects of food science and technology with a special focus on bridging the gap between industry and academia. The programme has so far produced about 260 graduates with 82% of them securing an employment opportunity within six months after graduation. A key contributor to the high level of employability is the final year research project in which undergraduates are required to carry out an independent research to solve an industrial problem related to food technology and food processing during a period of 15 weeks. Field excursions to industrial establishments also enable the undergraduates to familiarize with the industrial perspective of their academic knowledge.

A comprehensive curriculum revision is planned for a five year cycle. The current cycle was initiated in the year 2013. The initial phase was completed by gathering feedback from all stakeholders, i.e. academic staff, undergraduates, graduates, industry professionals, external resource persons and academics from other Sri Lankan universities. A SWOT analysis was performed to evaluate the existing curriculum followed by a gap analysis to identify the required knowledge, skills and attitudes profile of the graduates to comply with stakeholder requirements. The results from the analysis were used for the development of the current graduate profile. The contents of all existing courses were revised reflecting the current and emerging developments and trends in the field and stakeholder feedback.

New courses titled 'Entrepreneurship in Food Technology' and 'Technology and Innovation Management' were introduced to the proposed new curriculum. An existing course has been revised with the title 'Integrated Project in Food Science and Technology' incorporating concepts of new food product development where students are required to produce a product prototype followed by a feasibility study on the commercialization potential in which learning about industry liaison is expected.

In order to coordinate and streamline university-industry interactions, a faculty level initiative called Industry-Institution Interaction Cell (I^3C) has been taken. It is expected to sign MoUs with identified industries to enhance the quality of industrial placements for research projects. For the undergraduates to become familiarized with different industrial contexts, an initiative called Tech Talk has been taken where a talk is delivered by an alumnus from food industry.

One of the planned activities for promoting the university-industry interaction and fostering entrepreneurial skills is the establishment of a Student Business Incubator where undergraduates with innovative food product-based business ideas will be connected with prospective venture capitalists, business angels and mentors from food industry to transform their idea to a concrete business venture.

The Loblaw Academy Case Study: Measuring e-Learning success of a Training Program (R. Zanabria)

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Addressing growing public concerns with food safety and quality requires a good base knowledge of food safety practices which can be applied throughout the food supply chain. In 2012, Loblaw Companies Ltd. partnered with the Department of Food Science to use a new innovative approach and develop and deliver a comprehensive on-line food safety training program for their vendors. Eight critical food safety areas were identified and an on-line interactive e-learning format was designed. To effectively assess the participants' commitment, comprehension, and implementation of food safety practices, three assessment tools are used: (i) quizzes, to assess the participants' comprehension of the course material; (ii) assignments, to promote an in depth-analysis of each topic and assess the applicability of the gained knowledge and skills to their facility/processes; and (iii) interactive discussions, where participants learn from one and other, share materials, network and engage in food safety related discussions.

Up to date, over 300 successful participants have completed the training program. To measure how effectively the training program and approach accomplished its stated goals, the Kirkpatrick Model is used. Initial assessment (Level 1 and 2) was carried out through the completion of an online-survey and participants' feedback. Results show that 90% of participants rated their food safety knowledge and skills after completion of the program as 'Excellent' or 'Good', 65% would recommend the program to their co-workers, and 70% were looking forward to more food safety training modules. Also, resources and materials used throughout the Academy were considered relevant, comprehensive, easy to understand and follow, and well organized (> 85%).

Improvements in food safety practices were mainly referred to as behavioral changes in their work sites, including sharing and transfer of information to their co-workers and management teams (e.g., by means of internal presentations/training), improvements / updates to their company's written food safety policies and procedures, and management commitment to new training modules (Level 3).

Further training sessions (+100 participants) started on September 2014, and 3 additional training modules for previous graduate Loblaw Academy alumni run through January – December 2014. Also, following the successful delivery of this program, a new training initiative started on September 2014, named the *Guelph Food Academy*. These new offerings set the next phase for data collection to evaluate the effectiveness of the learning outcomes according to the proposed model. Further approaches may include the use of observational surveys and more-in depth analysis of the business benefits associated with the programs.

Food eco-innovation training (A. Marsset Baglieri)

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ECOTROPHELIA is part of French "Initiatives d'Excellence en Formations Innovantes" (IDEFI–Excellence in Innovative Education Initiatives), relating to higher education and research. The IDEFI projects are managed by the National Research Agency (ANR), and aim at promoting new training approaches and new educational contents. The IDEFI - ECOTROPHELIA project displays a double goal. On one hand it aims to contribute to strengthen the competitiveness of agribusiness companies, including SMEs, by providing courses and training in food eco-innovation. On the other hand it aims to build an innovative pedagogical model. The members of the project are 13 French School and 4 French professional organizations, its supporting is assumed by AgroParisTech and its management by the CCI Vaucluse. The project is structured around four work packages for two category targets: students and professionals:

- **WP1:** dedicated to the identification good practices and tools in food innovation. The principal deliverables of this WP are a toolbox of methods and tools for project management innovation and food design management. Its function is also to propose a network platform in order to share this knowledge between academics and industries' actors.
- **WP2:** definition of needs for eco-innovation and eco-design teaching, creation of supports answering to this need. Principal deliverables of this WP are some based on LIFE Cycle Assessment (LCA) case studies of food products (cases studies including data, tutorial for modeling steps, scenario and results), support on how use these data to create a new business model and a food eco-innovation lexicon.
- **WP3:** the ECOTROPHELIA France competition is a national eco-innovative food product design competition opens to teams of students enrolled in any higher education scientific institution and / or marketing school on French territory. The competition has been created in 2000 by the Chamber of Commerce and Industry of Vaucluse. The principal deliverables of this WP are to propose an evolution of the French competition and to increase the support given to students in their relations with the companies. In particular this WP develops a documentary support for the students including information about the preparation of the competition but also some documents defining the legal framework usable for their relations with companies interested by the development of their innovative products.
- **WP4:** the activities of this WP are dedicated to the development of a European network on the food eco innovation teaching. This WP has as targets to identify European centers of skills and interests about this subject in aim to integrate or to initiate a network on this thematic.

An outcome of this Idefi EcoTrophelia is the development of another project: FoodLab-European Foodbusiness Transfer Laboratory. This project coordinated by the CCI Vaucluse involves the Idefi ECOTROPHELIA members and various European companies. This platform, support of the European FoodBusiness Transfer Laboratory, will contain all the educational contents to stimulate e ntrepreneurial skills, to help students' project maturation and facilitate innovation transfer into business. It will also target other types of users such as teachers, SMEs, and entrepreneurs.

The University of Hohenheim: Overview on Research, Training and Food Study Programms (Susanne Braun)

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The current profile of the University of Hohenheim is unique due to the combination of its three faculties (Agricultural as well as Natural and Business, Economics and Social Sciences). Today, the University of Hohenheim is an internationally oriented campus University focused on cooperation and research. “Food Processing” is one of the main research focus areas at the University. The production of safe and stable food or nutrient formulas demands the production of extensive knowledge in the following areas: (1) Interrelations between ingredients of foodstuffs and microorganisms or enzymes, (2) Interaction of ingredients with and in the complex food matrix and (3) Development and establishment of adequate technological processes

Research activities in the fields of food science, biotechnology and food chemistry are well established at the Faculty of Natural Sciences due to the various and continuously evolving departments affiliated with these disciplines. Excellent experimental stations and state of the art laboratories are the foundation of our research. We are engaged in successful and intense cooperations with research institutions, as well as food companies and their suppliers.

The Bachelor's and Master's programmes are up-to-date and practice-oriented in their teaching and research. The B.Sc. programme “Food Science and Biotechnology” is an interdisciplinary course of study in the life sciences. It deals with the scientific methods necessary to develop technological processes for producing foodstuffs and healthcare products. Students of the programme are introduced first of all to the relevant basics of natural and engineering sciences. The programme is designed to prepare students for a future career in the food sector and for conducting basic and applied research. Graduates can make significant and sound contributions to new developments in food science and food technology as well as industrial biotechnology.

Since 1999, the University of Hohenheim has been offering different Master's programmes. The offer is continuously being extended, so that a wide range of subjects, corresponding to current developments in science and society, can be provided. Example of Master´s programmes are: Bioeconomy, Clinical Nutrition, Environmental Protection & Agricultural Food Production, Food Chemistry, Food Microbiology and Biotechnology, Food Science and Engineering, Molecular Nutritional Science, and Organic Agriculture and Food Systems.

Since the first of April 2015, the Hohenheim Research Center for Bioeconomy establishes this interdisciplinary topic in a targeted and sustainable way at the University. Across all faculties, the center works on the primary research topics of Bioeconomy. It actively supports the procurement and execution of national and international collaborative projects at the University’s faculties and institutes. The Hohenheim Research Center for Bioeconomy contributes to the University’s national and international profile in the future-oriented topic Bioeconomy. The research center includes the University in important national and international committees and initiatives and connects it with key actors. It takes on the coordination of international network projects and platforms.

The University of Hohenheim is currently working in numerous European projects. One of them is the EU FP7 TRAFOON project of which we are the coordinator. The project has set sail in November 2013 to establish a knowledge transfer network with a focus on food products made of grains, fish, fruits, vegetables and mushrooms to support traditional food producing Small and Medium Enterprises (SMEs). The TRAFOON network interlinks researchers, knowledge transfer agents, and SME associations in 14 European countries to foster sustainable innovation and entrepreneurship in the sector of traditional foods for the benefit of the regions of Europe and the European consumer.

University-Industry educational and training initiatives - Some personal views based on experiences at UCD (Brian M. McKenna)

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To develop a sustainable model for University-Industry cooperation a two way flow of assistance is essential between the university and appropriate industries. In the case of UCD Food Science, this consisted of:-

University to Industry

- Classical short life-long learning courses
- A part-time taught Masters programme spread over 2 academic years and only available to industry participants and providing food science and technology expertise to graduates from other scientific disciplines.
- Introduction of a mandatory undergraduate internship period in industry
- Adding industry related modules to the curriculum, e.g. product development

Industry to University

- Frequent seminars from industry scientists
- Provision of internship places and mentoring
- Involvement in research programmes
    - Ideally with partial funding of research
    - Board membership of university research substructures
- Industry provision of modules in the taught component of structured PhD programme

More generally, cooperation was fostered by the establishment of a dedicated unit to support entrepreneurship, NOVA-UCD, and the promotion of an innovation culture by including it in the promotion assessment process for academics.

However, the success of any University-Industry initiatives is primarily based on the establishment of close personal relationships and trust between the two organisations.

Opportunities in HIE / Industry cooperation – the key to continuous improvement (Pilar Morais)

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Frulact supplies B2B products and services with excellent quality standards, which aim at meeting and surpassing customers' needs and expectations. For this purpose Frulact invests approximately 2,7% of its turnover back into Research, Development & Innovation (RDI) activities. Frutech is Frulact´s dedicated RDI center, opened in January 2012, in Maia, Portugal. This includes lab scale and pilot plant facilities as well as fully equipped Food Microbiology and Physico-chemical Laboratories, a video-conference room, an Auditorium, a Sensory panel room and a Library. Frutech centralises the group´s RDI activities and is dedicated to the continuous improvement of Frulact´s RDI strategy, aligned with the latest market trends and new technologies.

Frulact cooperates with various High Educational Institutes (HEI) to explore and internally disseminate useful knowledge both in day-to-day activities but mainly cooperating in medium and long-term projects with a certain degree of technological uncertainty. These projects involve confidentiality agreements.

To support and grow its partnership with HEI, Frulact promotes: short and medium term internships, study visits to Frutech, which usually include on site lecturing of classes, study visits to its production units, cooperation in RDI projects funded by the Portuguese government and the European Union, sponsoring of student grants and specific projects and others.

The main challenges found in Industry– HEI cooperation are:

- The alignment of fundamental research oriented activities from HEI with the company´s business strategy
- The balance between cost and gain in RDI projects, that is to say the weight of HR resources, equipment, raw material costs used in trials against results which can be replicated and used to support the company´s economic growth.

Frulact's cooperation with HEI has allowed:

- During internships, in real-life company environment, the identification of talented students, who possess Frulact´s desired professional and personal profiles »» student employment
- The development of RDI projects, supported by the research activities and technical knowledge of lecturers and researchers in their areas of expertise »» useful knowledge which can increase the company´s sales turnover
- The identification, investigation and access to the latest developments in processing technology, physicochemical, microbiological, organoleptic and other scientific areas »» continuous improvement
- The promotion of networking with clusters, governmental agencies, training centers, researchers, laboratories and so on »» networking
- The knowledge and participation (sometimes joint-participation) in events such as seminars, conferences, webinars, workshops, and others which are aligned with Frulact´s training strategies for its teams »» continuous training

Academic gains from Knowledge Transfer Partnerships between Plymouth University and food SMEs – An experiential learning taster for students and a business literacy degustation for academics (Victor Kuri)

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Challenge: Can academics develop business acumen by getting involved in industrial partnerships?
A KTP (Knowledge Transfer Partnership) is a UK-wide programme helping businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills that reside within the UK Knowledge Base institutions, mainly universities. The programme is partially sponsored by public funds, with substantial contributions from the food company. When applying for grants, the focus tends to be in addressing an industrial challenge, with implied benefits to the academic partners. However, is not always very clear what are those gains, particularly when they become evident time after the completion of the year project.

Solutions: This paper will describe examples of secondary activities and university gains, by the different players from the project associate (a graduate hired for the project), the academics involved, and the students in related courses, compiled from 15 projects over 15 years, with projects mostly focused on process and product improvement, quality systems, safety and traceability.

Knowledge generated or interpreted in academic institutions (knowledge base) is not always directly applicable to business, and through extensive or intensive adaptation it becomes valuable. A qualified person with a direct link to the academic source is the ideal transfer agent. Typically a recent food science /food technology graduate will be hired to fulfil that role.

Examples of activities involving masters or undergraduate students include small projects derived from industrial challenges, sometimes carried out by individual students in work-based learning activities, placements or dissertation work. Examples of group activities include practical sessions when students work on a semi-structured setting to solve problems which are relevant to the partner company, for example on product development, process optimisation, visits where food production lines are monitored and studied, with samples taken and processes analysed; or company sponsored innovation competitions where student-generated ideas are taken into the marketplace.

Benefits: Students would be aware of how their contribution, and their training, is relevant and current, as they address current challenges and solve real problems. Furthermore, company staff and associates (recent graduates) are invited to deliver talks and work along with students, in an atmosphere where a continuum professional development is experienced and a career path in the local agri-food sector could be easily visualised by students with stepwise stages that appear within reach. It can be argued that these activities have a function in career guidance.

The scheme seems to be about knowledge and technology transfer, but it is the participants who develop and carry the skills and the real know-how to promote innovative changes in the food businesses. The cultural changes are in several directions, sometimes focused on the main associate, but commonly they are bilateral, and they transform those in academia towards how they perceive knowledge and to value their skill-set as it is applied in a context of commercial reality.

Avances on pilot plant and cooking lab facilities for training and education (Cristina L.M. Silva)

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Food processing is constantly facing new challenges in terms of developing new products, which are innovative, healthy, easy to consume, sustainable, among other characteristics. The combination of food science and technology with nutritional knowledge is more and more a requirement from food stakeholders.

To answer the education and training requirements from food industry, the implementation of a cooking lab combined with a food processing pilot plant is the most adequate strategy from a University willing to bridge the gap between the academic teaching and the industrial and employees training needs.

The Escola Superior de Biotecnologia of Universidade Católica Portuguesa recently built a new cooking lab next to its classical food pilot plant. This cooking lab has all the facilities to develop new products and processes that can then be tested at pilot plant scale, packed and carry out shelf life studies.

These new combined labs are being used by 1st, 2nd and 3rd cycle students, from food engineering to nutritional sciences degrees, and its potentialities are starting to be highly requested by local food industries, particularly small and medium enterprises, for training of their employees and developing new products.

Innovative pedagogical and learning experiences – Experiences of Service Learning in Citizenship Education (F. Sadio Ramos)

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The work corresponding to this text – *Experiences of Service Learning in Citizenship Education* – and its presentation to the Congress refers to the transversal curricular component of *citizenship education* which is part of the curriculum of the educational offer of Polytechnic of Coimbra School of Education (ESEC). In the academic and professional training undertaken at ESEC, this educational dimension – essential according to the European Higher Education Area (EHEA) and thus consequently assumed in our curriculum –,the possibility of conducting projects and essays in which different dimensions of citizenship is often contemplated.

The works are realized during one semester and are the object of a public defence session in which its contents are presented and debated by the student's peers and the professor of the curricular unit/ discipline in question. Some disciplines are vocationally aimed at these problems, such as "Ethics and Citizenship" and "Themes and Problems of Today's World". However, this is a general and transversal concern of the pedagogical work of ESEC, having in mind both the above stated concerning the EHEA and the polytechnic nature of ESEC, that is, its holistic education perspective. In consequence of this educational/ educative vision, there's a wide range of themes addressed by the student's works, either theoretical approaches of the themes or service learning projects, with more or less involvement of the author(s) in the community, institutions or organizations (be it ESEC itself or the surrounding socio-geographical area).

Some possible works performed by the students have their themes related with food issues and attitudes, in different perspectives of approach: human rights issues, addressing hunger and distribution of resources, food behaviour facing, for instance, questions like obesity, anorexia and bulimia diseases.

In our experience, namely using the service learning perspective, some relevant projects have been conducted in the curricular unit of "Training of Trainers", ministered in several grades at ESEC. During the semester in which the training takes place, the students are confronted, among other curricular and assessment demands, with the necessity of producing an educative project of intervention. The semester's work is aimed at the conception and production of the project, but the students have in mind its eventual application in the following semester if their internship provides the opportunity for its implementation.

Of the past projects, we chose for this presentation a brief reference to two service learning projects realized in that discipline in the grade of Social Gerontology and aiming at working with elder people.

Both projects have their starting point in the need to care of the increasing number of older people in what concerns their nutrition. One of the projects was directed to the definition of a programme of training of home-carers of elder people, while the other took into consideration the development of good nutrition habits of senior persons.

The development of these projects allowed the students a considerable pedagogical experience of facing the issues concerning the importance of good quality nutrition of senior persons in two

directions: on one hand, the promoters of the project and, on the other, their colleagues participating on the public discussion raised by the process of their defence.

Two major ideas, industrially relevant and pertinent in what concerns knowledge transfer, we raised on that discussion have to do with (a) the need of producing a senior-kit destined to the facilitation of the nutrition of the elder, containing both important simple nutritional information and diet suggestions specifically for that public and (b) the lack of a range of food products conceived and appealing to this public, having in mind suitable quantities and prices.

Traditional versus modern in stimulation of creativity (Liviu Giurgiulescu)

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Many times one of the main ways of working in the classroom teaching is exposure. Modern teaching has shown that this method is not sufficient for the acquisition of knowledge. In fact, learning involves much more. Education focused on this method was criticized because the discrepancy between knowledge acquired in school and the outside of the world.

The cause is that the student is still considered an object of learning and assessment method, which often involves reproduction of content. The high degree of generality of lessons, excessive abstraction, the tendency of teachers to teach as much information, often beyond the school curriculum does not meet the need for flexibility and diversification of student thinking. Attempts students out of the box, the answers are often translated as nonconformist violations of rules, which, in fact, block creativity.

Have been developed methods and models, among them is the method projects. Students were encouraged and supported to express their study interests openly, without any conditioning or curriculum related matters. Then, with the support of the teacher, students sought to develop projects that address a particular issue. Sources of information, references were clearly established at the outset.

Modern teaching offers as main methods of teaching and learning problem solving and discovery learning. These methods aim at transmitting new knowledge as students practical situations to increase. The subject of learning need to find problems, the solution will be in natural consequence.

The proposal developed above is as individual education organization. In addition, can be used and organizing the work in small groups (4-5 students). These two methods are alternative form of organization of the education front the teacher works with the whole class simultaneously active student is too little.

The most important problems related to this method are the fact that such activities are time consuming and require a careful selection of learning content. Accordingly, didactic exposure cannot be completely eliminated.

Problem-solving content can thus be a viable alternative in order to improve the exposure and the development of creative thinking of students.

Talent Development: the view from the R&D in the industry (Marc Dreyer)

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In a large and complex corporate, the “one size fits all” for talent development will not work. We cover the whole innovation value chain, from ideation to technology transfer to factories, from basic life-science to process & product development, to industrialisation. We may have scientists with a high academic achievement next to a technologist with a high impact from technology transfer. Each has different skills and competencies that may contribute equally, but in a different way, to the company. And these may be employees in Europe, Asia, or America, from our different centres. Each will contribute with a different culture, and background. And they may be working also on very different product categories, having to master different practices as well. Operating along the innovation stage, whether at the fuzzy front-end, or whether at the execution, is also requiring a different mind-set. In order to cover this, we have defined an approach that is linking achievements, defined as impact on the company business, to a valuation of the contribution of the employee. This can be summarized as an ability to generate and transfer relevant knowledge that contributes directly or indirectly to the success of a business stream. For this, we have developed tools and practices that allow us to get a sense of the impact of our R&D employees. And to make it short, generating knowledge would reflect expertise, while transferring it would reflect leadership. Both are required, and both must go together in order to achieve high impacts in our organisation. These impacts and achievements are periodically reviewed, typically during the yearly discussion, and more often when required. This is then the opportunity for the employee and his line manager to discuss the development needs, or the enablers that will facilitate a career progression. Such enablers, reflected in development plans, have the structure of 70/20/10, where 70% of the talent development is the result of stretched assignments, 20% of relationship with peers and other experts, and 10% only resulting from a formal training.

ABSTRACTS OF POSTER PRESENTATIONS

Product development of new soft drink made from birch sap and sea buckthorn juice (R. Bobinaite)

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The challenge of the research: soft drink concept generation, recipe development and laboratory testing of the product. A range of products containing different proportions of birch sap and sugar-sweetened, concentrated sea buckthorn juice was prepared and the best combination was selected by evaluating taste, odour and colour. The best-tasting beverage was then treated applying various ultrasonication regimes for better storage stability. The influence of ultrasonication on soft drink sedimentation, pH, titratable acidity, total soluble solids, CIELab colour coordinates and content of total carotenoids and β-carotene in beverage was evaluated. In addition, the taste of beverage samples treated applying various ultrasonication regimes was evaluated using a multichannel taste sensor system (e-tongue). The soft drink made from 70% birch sap and 30% sea buckthorn juice had the greatest acceptance (93% of the panelists). The best storage stability and the highest concentration of carotenoids in the beverage were achieved applying the most intense ultrasonication regime. E-tongue measurements showed that intense ultrasound treatment also had an effect on the taste of beverage made from birch sap and sea buckthorn juice.

The development of new soft drink was carried out as part of the training courses for private enterprises seeking to innovate in response to important beverage trends. Product innovations are important for the competitiveness of food processing companies. However, a lot of small and medium-sized food enterprises in Lithuania do not carry out R&D activities due to a lack of financial, material and personnel resources. The training took place in the open-access laboratory for fruits and vegetables processing technologies and modelling at the Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry. The open-access laboratory was established in order to assist business enterprises in development of products and processing technologies.

Wine industry residue valorization in animal diet- continual professional development through antioxidant activity research (Veronica Sanda Chedea)

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Romania ranks in 2012 on the 12th place in Europe and 21st place in the world in terms of wine production, with 123450 tones, resulting a large amount of waste that needs to be managed. During grape processing, it is estimated that 20% of total weight of grape fruits used results in grape pomace that presents a challenging waste disposal problem for the winery and grape juice industry. An alternative utilization of the grape pomace could involve the isolation of the grape seeds and extraction of polyphenols. Little evidence is available on the potential antioxidant properties of grape pomace (GP) when added in piglet diets. Studies investigating the use of this residue may lead to significant economic gains and to prevent or decrease environmental problems caused by GP accumulation.

In this context polyphenols' antioxidant/prooxidant activity research started in "in vitro" and "in model solutions" in university laboratory is now transferred at pilot scale trying to elaborate new diet recipes for animal feeding. The actual experiments done at the farm level in a research institute involves a high amount of work done by ungraduated, Master and PhD students besides the senior scientists running the studies. Overall during the different phases of the project, the total polyphenol composition of the feed is determined, "in vitro" on cell culture the antioxidant and anti-inflammatory effect of grape seed and pomace extracts are tested, animals are fed with an enriched diet in polyphenols and at the end the polyphenols' absorption, health status and general state of the animals are checked.

The project focuses on the construction, validation and development of a pipeline to transform wine industry waste into sustainable feed ingredients which further will be translated in feed recipes for animal farms. Generating a greater profit from the grape residue should grow the bio-economy across the whole chain from wineries to customer, involving the research institutes and universities, and deliver on the circular economy agenda also. Working in the framework of this project, besides of getting professional experience in research and its applications, the students would get a broader view of practical reuse of agrifood waste.

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Interest to insure trainings in distillation on industrial sites (M. Esteban-Decloux)

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Since 1986, I insure trainings on the distillation of alcohol solutions in the industrial sites of production of neutral alcohol and bioethanol, at least 10 days per year. After an introduction on the organisation of a plant producing neutral alcohol and bioethanol, I explain the principle of the ethanol distillation: the link between the reflux ratios, the heat required at the bottom and to evacuate at the top and the number of plates necessary. If used in the factory, I develop the influence of the pressure on the liquid-vapour equilibrium data, the boiling temperatures and the enthalpy, then I explain the principle of double effect distillation. Afterwards, I explain the behaviour of the main other volatile compounds (higher alcohols, esters, aldehydes, acids) and the way to take them off to produce a pure neutral alcohol. At least, I explain the way to overtake the azeotrope and to produce bioethanol with molecular sieves or extractive distillation with cyclohexane.

Thanks to these formations, I developed an expertise in the alcohol domain. Thus, since 1995, I supervise studies on the distillation of brandies (cognac, calvados, rum of Martinique) and since 2001, I supervised 3 students in doctorate (one in the rum field to optimise the quality, the second one on the simulation of the production of neutral alcohol and the third one on the distillation of bitter orange peels macerated in dilute neutral alcohol. At the moment I'm involved in the supervision of 3 doctorates: one on the simulation of the distillation of different brandies, the second one on the distillation of Cognac and the third one in continuation of the previous doctorate on the production of bitter orange peel distillate.

In plus, several engineers of AgroParisTech work in engineering companies specialized in the design of distilleries.

A first approach of the food and biological industries (FBIs) for engineer students (M. Esteban-Decloux)

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To introduce the FBI sector to the 340 AgroParisTech 1st-year students, a 15 h-module is organised. It includes first a presentation of the FBI sector during 1h30: its evolution with a complexification of the processes and the creation of intermediary products, the importance for a factory to take into account the consumers as well as the authorities and sanitary questions, and at least the many kinds of job in that sector for an engineer from AgroParisTech.

Then the student are separated in small groups of fourteen to prepare a visit of an industrial site. In each factory a meeting is organised if possible with the dire5tor and people with responsibilities in the production, research, laboratory and environment.

At least each group of student prepare an oral presentation of their visit in around one hour including the discussion. Thus the students apprehend FBI through their challenges, the organisation of the transformation process and the diversity of professions.

It is a real challenge to organize 24 accessible visits of factory on 4 days been imperative by the timetable that is 6 visits in parallel every day. But it is also an opportunity for AgroParisTech to strengthen its links with the food industry and an opportunity to involve more than 20 teachers.

So, even if the students do not choose the sector of processing industries as domain of formation for their next year, they are conscious of stakes in this sector.

Summer Lab on Special Food Technologies (L. O. Figura*)*

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In a world of changing consumer needs and emerging challenges for the global food industry universities have to be open for new methodologies of instruction. Because food production is an international business students need multicultural skills and technological knowledge they can apply in international surroundings. For this goal an innovative study course on Special Food Technologies in cooperation with DIL research institute and several food companies was set up and tried out. The course `International Summer Lab on Special Food Technologies` consists of hands-on laboratory activities during summer break, work in international teams, seminars with speakers from industry and academia and field trips to production sites. Guest speakers are involved from manufacturers of

- ice cream products
- meat products
- spice powders
- hydrocolloid ingredients
- flavoring ingredients
- food emulsions
- cosmetic emulsions
- dispersing machinery
- high pressure equipment

In the summer lab the professional experience of industry speakers is put to classroom. With a set of lessons, company visits fields and hands-on laboratory activities students team up to develop real food products. The products are characterized by appropriate analytical measures and sensory analysis. The results are discussed and presented to the Summer Lab students and instructors. The course is accompanied by e-learning sessions and online exam.

The course was performed 2011 - 2014 and evaluated by quality management tools. Positive effects are getting open minded, multi cultural skills in food product development and better understanding of process engineering technologies. Students enjoy close contact to industry speakers and food researchers during summer break to improve their knowledge and career plans. Course participants like the international and interdisciplinary concept to train food engineering. Highest rank is given by students for working with real products in hands-on laboratory teams.

Best Practice in Austria: Knowledge Transfer by the Food Technology Network (Christine Grabler)

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Competitiveness of enterprises in the food sector is increasingly determined by the capability to innovate and constantly improve goods and procedures. The velocity of technical development as well as the evolution of standards for products and processes entailed a beginning decoupling of developers and operators. In response to the growing technological and managerial requirements emerging in the food sector the need for an efficient and competent knowledge transfer institution in Austria has already been detected in the late 1990's.

The physical realisation of this institution was eventually put into practice with strong engagement of the Food Industry Association Austria (FIAA). It was planned as a knowledge transfer platform, designed to establish contacts and facilitate exchange between research institutions and food production entities. The "Food Technology Network", founded in 1999, is since then proactively working in the field of research and development for innovation in the food sector. Trained mediators are acting as interfaces between university research and industrial as well as artisanal production. It is their task to collect needs and ideas from national food producers, many of them SMEs, and act as contact point. Mediators are also involved in the exchange of research approaches and scientific solutions through intensive contacts with scientists on national and international level.

The "Food Technology Network" defines itself as a platform for facilitating interchange. On one hand it provides services for the translation of clients' concerns and problems to research topics while on the other hand it takes care for the conversion of research results into practical applications and solutions. This approach makes it possible for food producing companies to benefit from research tailored to their needs; equally scientific institutes take advantage of the access to a pool of ideas for possible starting points for research.

The portfolio of the "Food Technology Network" encompasses the collaboration with agencies and ministries for funding within specifically developed programs and schemes.

Continuous support is provided moreover by an educational program that is offered for food companies throughout the year in the form of professional training. The schedule includes regularly organised events, which can be attended externally, as well as individually arranged in-house-trainings for company internals. Experts in the respective field of training are invited and share their knowledge and experience with the participants, who benefit from learning basic knowledge plus recent developments and best practices. The scope of trained issues ranges from hygiene and microbiology to sensory analysis and quality management as well as food law. With about thirty training events per year attended by nearly a thousand participants this program is leading the market in Austria.

Recovery of phenolic compounds from nixtamalization wastewaters using a narrow membrane (1 kDa) (R. Castro-Muñoz)

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The Nixtamalization wastewaters (NWs) are a by-product of food processing industry. The extract is produced from maize processing industry by a common Nixtamalization process applied to maize as pretreatment in order to have more manageability of the grains during their post processing. This wastewater is rich in valuable components as polyphenols, hydrolyzed parts of the grain as well as calcium hydroxide added during the pretreatment. There is strong evidence that NWs collaborate to the environmental pollution due to its high chemical composition. The aim of this study was to evaluate a membrane process as ultrafiltration using a narrow membrane (1 kDa) to recover high added value compounds as well as avoid the water and environmental pollution by effluent. Before the processing of 1 kDa membrane, the NWs were clarified by ultrafiltration using 100 kDa membrane.

The NWs were analyzed in terms of total soluble solids (TSS) (0.80±0.0 ºBx), total solids content (TSC) (0.79±0.0%), turbidity (5.44±0.84%), pH (13.37±0.0), density (987.81±0.80 g/L), electrical conductivity (1558.33± µS/cm), carbohydrates (1.08±0.0 mg/mL), polyphenols (970.37±16.03 mg/L), total organic carbon (TOC) (1908.48±0.35 mg/L) and calcium content (814.80±5.26 mg/L). The extract was processed in recirculation mode at different transmembrane pressures (TMP) (69,103,138 and 172 kPa) in order to find the optimal TMP for carrying out the separation of NWs in batch concentration configuration. The operating conditions to separate NWs in batch concentration configuration were at TMP (172 kPa), feed flow rate 58 L/h and temperature 25 ºC. The narrow membrane (1 kDa) presented high retention values (R_i) on TSS (100%), TSC (77.58%), carbohydrates (75.77%), turbidity (30.76 %) and TOC (79.98 %); however, the membrane presented low retention (1.90 %) in polyphenols.

After membrane separation process, two valuable fractions were produced: A clear fraction rich in polyphenols (951.85±6.99 mg/L) was obtained, this fraction presented low organic load in terms of TOC (381.99±0.03 mg/L). In case of phenolic enriched-fraction, it can be used in food, pharmaceutical and biotechnological applications due to their biological activities. On the other hand, the calcium was concentrated in retentate fraction (3155.3±5.24 mg/L), this stream can be reused in following nixtamalization processes as calcium hydroxide in solution. Finally, the recovery of chemical components by membrane technology is a real approach to the treatment of food wastewaters as well as seems to be a valid tool on food industry for processing of aqueous systems. In addition, the fractionation of NWs using a narrow membrane supports the contribution to avoid the environmental pollution by food wastes.

The project focuses on development of ultrafiltration system to treat an aqueous by-product of food industry. Working in the framework of this project, besides of getting professional experience in research and its applications, the students would get an overview of practical reuse of food wastes.

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Portable biosensors for the rapid detection of food toxicants (G.-P. Nikoleli)

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A chemical sensor is a device that transforms chemical information, ranging from the concentration of a specific sample component to total composition analysis, into an analytically useful signal. Chemical sensors usually contain two basic components connected in series: a chemical recognition element ("receptor") and a physicochemical transducer. The biological recognition system translates the chemical information (i.e., concentration of the analyte) into a chemical or physical output signal. The transducer (i.e., a physical detection system) serves to transfer the signal from the output domain of the recognition element to the electrical, optical, or piezoelectric, etc. domain. A biosensor is a self-contained integrated device which is capable of providing specific quantitative analytical information using a biological recognition element (e.g., enzymes, antibodies, natural receptors, cells, etc.) which is retained in direct spatial contact with a transduction element.

Increases in food production and the ever-present threat of food contamination from microbiological and chemical sources have led the food industry and regulators to pursue methods of analysis to safeguard the health and safety of the consumer. Although sophisticated techniques such as chromatography and spectroscopy provide more accurate and conclusive results, screening tests allow a much higher throughput of samples at a lower cost and with less operator training, so larger numbers of samples can be analyzed with faster time of analysis and smaller error. Biosensors offer the unique opportunity to overcome these problems; however, biosensors are still at a laboratory testing stage and it is necessary to transfer a laboratory prototype to a scale up production and commercialization. This will have a large impact on both industry and students training. New companies will be launched and, hence, this can significantly contribute to the European Union's aspirations for wealth generation by the creation of small manufacturing enterprises (SMEs). Sensor Technology has been identified as a priority area across the globe and it is essential for European competitiveness to enhance our scientific prowess in this area and capitalize effectively upon it to realize real benefits and commercial products in this highly competitive international arena. New jobs will be created and this will therefore lead to new areas of students training and open routes for launching courses on how to train students in biosensor technology.

Biosensors clearly offer advantages in comparison to standard analytical methods, such as minimal sample preparation and handling, real time detection, rapid detection of the analytes of concern, use of non-skilled personnel, etc. Because of the importance of the ability of biosensors to be repeatedly calibrated, the term multiple-use biosensor is limited to devices suitable for monitoring both the increase and decrease of the analyte concentrations. Thus, single-use devices which cannot rapidly and reproducibly be regenerated should be named single-use biosensors, etc.

The aim of this presentation is to bring into focus this important research area and advances of biosensors in food analysis and technology and more specifically to those related to the rapid detection

of food toxicants. The scope is related to provide a comprehensive review of the research topics most pertinent to the advances of devices that can be used for the rapid real-time detections of food toxicants such as microbes, pathogens, toxins, nervous gases such as botinilium toxin, *Escherichia coli*, *K. Pneumoniae*, sarin, VX, *Listeria monocytogenes, Salmonella*, marine biotoxins (such as palitoxins, spirolides, etc), staphylococcal enterotoxin B, saxitoxin, gonyautoxin (GTX5), francisella spore virus, *Bacillus subtilis*, ochratoxin and even simple chemical compounds. Biosensors have found a large number of applications in the area of food analysis. Recent advances include portable devices for the rapid detection of insecticides, pesticides, food hormones, toxins, carcinogenic compounds in environment, such as polycyclic biphenols, dioxins, PAHs, etc.

Employment insertion for Industrial pharmacists' health specialist from the Spanish Ministry of Health through stage training by the Industrial School - CEU San Pablo University with the pharmaceutical industry based in Madrid (LA. del Rio)

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Spanish Specialist Health Program is held annually in accordance to Royal Decree 123/2008 by the Ministry of Health and authorizes not only the Hospital System, also Industrial Pharmacy Colleges to be in charge for the education and training of 244 future specialists. The program for Industrial Pharmacy according to official requirements guarantee that the specialist have acquired practical knowledge, skills and attitudes in different fields such as Manufacturing, Development and Quality Control and Assurance of their industrial application.

As the Official Program is a practical training, our School could implement all type of measures, annual ratings and particularly training transfer to collaborating laboratories according to selected tutors and training plans. An industrial career is provided to each resident according to the skills and knowledge that have been detected in each of them for developing as well as checking their progress during the formative period in the manufacturing companies.

The evaluation of every stage of the hands-on period has been driven by selected professional leaders who knows their role within the group and marks the suitability about the performance of simulation cases and problems in order to acquire training and decisions skills.

The professional incorporation of our residents through has been appreciated as the high rate of employment that has been achieved at industry even before finishing their training period in most of the cases. A majority believe that the training received in our school has been useful for getting the employment in the pharmaceutical industry quickly and in a responsibility related with the training received. With no less justification for the above, there has been an increase in the length of stays in laboratories on a proposal from the labs, allowing residents more experience in professional development that is constituted as a competitive advantage for the market.

Development of DE'SWITZ FST BAKERY CAFÉ at the Faculty of Science and Technology, University Kebangsaan of Malaysia (UKM) (N. Abdullah Sani*)*

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De'switz FST bakery is wholly owned by Switz Baker Enterprise (SBE) which are developed by seven students from the Food Science with Business Management/ Nutrition Programs of the Faculty of Science and Technology (FST), UKM. They are doing this under the Centre for Entrepreneurship and SMEs Development (CESMED) in UKM with the support from the FST. The course is known as CMIE 3016 – Senior Start-Up, and the objective is to provide opportunities for students to apply basic knowledge in entrepreneurship. The course runs for two consecutive semesters and are delivered through e-learning and in-class discussions involving the identification of business opportunities, development of business model canvas, marketing techniques, accounting management, and the construction of a business plan. Students will develop products/ services that they identify, marketing strategies, establishing companies, and provide a business plan to be presented for the purposes of 'pitching' to investors. At the end, students will have the experience to build their companies and work on them. In addition, the students also must write a report on the business that they have developed.

The idea of setting up a bakery café was initiated by their lecturer who has an R&D link with an international bakery factory based in Selangor, Malaysia. The **challenge** was to meet the target sales of RM1,000.00 and finding a strategic location. The students initially visited a similar café at Multimedia University (MMU) and conducted a marketing survey both at that university and UKM. They had to face other **challenges** such as obtaining capital, achieving target sales by selling at several functions, installation of 15 amp sockets etc. The **solution** was obtaining the bakery cafe at the Student Activity Center, FST, UKM. Other **solution** was having an agreement with the bakery factory which provided them training, loan equipment and ideas on how to improve sales. Their customers are UKM students, lecturers and other staffs from the FST and the Faculty of Economy and Management (FEP) due to their locality to the bakery cafe. Promotional methods used are via social media including facebook, twitter and instagram and advertisements via poster, bunting and flyers distribution. The 13 types of products are sold between RM2.00 to RM4.00 each and having profit margin of 25% to 104%. The sales for the first two weeks in November 2014 was at RM7,275.00. Their target sales is expected to increase to RM30,000.00 per month. As a **solution**, some of their profits will be used to improve the bakery facilities. An endowment fund to contribute 5% of their profit will be created to increase students' entrepreneurial activities at the FST. This is one of the successful entrepreneurial activities since the program was first introduced to the FST in 2013. Other **benefit** is that they have met the target sales and presented a good report. It also fulfills the CESMED's objectives which are to promote and develop an entrepreneurial culture, providing students with entrepreneurial experience and consultancy services through entrepreneurship education towards a sustainable company.

Involvement of the food industry in education and training at BOKU (Gerhard Schleining)

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Food Science and Technology education and training involving the Food Industry is following a bi-directional concept. On the one hand, the integration of industry representatives into food science and technology lecture of bachelor and master programs is seen as an essential part. The aim is to expose students to the challenges that post-graduates are facing when entering their professional life but also to bring the industry in early contact to the food science and technology professionals of tomorrow.

In Bachelor and Master programmes especially optional technical subjects like cereal technology, sugar technology, brewery technology, wine production, fruit and vegetable processing, packaging technology, technology of chocolate and confectionary and automatic identification technology but also subjects like toxicology, food law and economics are lectured by experienced senior experts from the industry. They are fully responsible for design, conduction and assessment. Another option which is frequently used is to invite experts from the industry to give a lecture on a special topic within a course, e.g. a 1.5h lecture on crisis management or continual improvement within the course quality management to let the students know what is really done in the industry, what are the challenges and outcomes.

On the other hand, the educational commitment of BOKU also includes the conduction of training courses for food science and technology professionals that are already in their job within the food industry. Such qualification seminars are organized as education programs consisting of up to ten full day sessions spread over the period of 6 months taking place at the university facilities and being executed by university staff. The course program is aligned with the industry delegates beforehand and is meant to refresh the basic knowledge in the food science and technology area as well as to provide information on recent developments in the area. It is the aim to create an environment where the professionals, that are usually busy with fulfilling their daily tasks, get the necessary impulses in order to trigger innovation in their business. Each daily program consists of a seminar like lecture providing the platform for knowledge transfer and discussion as well as a hands-on practical part in the lab and pilot plan where participants get an insight into new technologies and methods.

The main objective of this program is to facilitate small and medium size enterprises the access to new technologies and innovative concepts and to create long term relationships between industry and university with benefits for both sides. Funding for such programs can be obtained by the Austrian Research Promotion Agency. These qualification seminars are a first step within the established program on developing research and innovation competences for small and medium size enterprises. Subsequent activities include the establishment of qualification networks which are medium-term collaborations between academia and industry aiming at competence development beyond pure research projects.

Experiences and learnings form the organizers as well as feedback of the participants resulting from the two concepts described above will be shared and discussed during this presentation.

State of knowledge and technology transfer training and activities in the European Food Field (Cristina L.M. Silva)

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The goal of this research was to elaborate a strategic document with guidelines to promote and enhance the current situation on knowledge and technology transfer in the field of European food studies among the ISEKI_Food members.

A questionnaire was carried out by 81 institutions, involving mainly Universities from 31 countries. An international workshop was also used to discuss the topics. The work was approached on: i) the training and education needs, and ii) the knowledge and technology transfer activities already going on.

The questionnaire results confirmed the lack of enough training and strategies for knowledge transfer in a significant part of the institutions. However, among those already quite active in the field, it was possible to identify activities and methodologies more adequate for introducing knowledge transfer in training activities. Entrepreneurship, innovation and creativity have to be formally integrated in students training, especially in European regions other than the North.

Each institution has different knowledge transfer training and strategies. However, some constraints are common, such as the lack of time and human resource support for academic staff. More and more the financing sources will promote research towards its implementation, and intellectual property and ethics are key issues. Therefore getting financing for research becomes more and more complex.

It was concluded that it is crucial for institutions to have a strategy for knowledge transfer. On a long term there will be return of investment. Institutions shall have offices with business orientation, and capable of a fast reaction to industry and innovation requests.

Summer school in food processing (Ralph Thomann)

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IGV is a private center for applied research in the field of grain and herb processing, located half hour drive from centers of Berlin and Potsdam and Berlin airports

About 100 engineers, chemists, food technologists are working in scientific projects and in applied research. The equipment for grain and food processing (milling, grinding, dry fractionation, extrusion, co-extrusion, pelletizing, baking, toasting roasting of plant materials and also herb processing/essential oils) is available in lab and pilot scale.

All the trials and results are combined with the typical industry relevant analytical methods (chemical, rheological and physical).

IGV is offering building blocks of modules, which can be combined to the skills and needs of the students,

stepwise processes can also be combined to a small practical project with students raw materials

students will get impressions about planning and realization of practical trials from experienced scientists and technologists

In a two week course with 8 till 12 students we can realize practical trials in a 2 x 5 working days course. An excursion to a relevant research institute or enterprise close to Potsdam will be possible as well as cultural excursion to Berlin and Potsdam (Castle, park Sans souci, castle Cecilienhof Potsdam agreement in 1945).

For accommodation we will use hostels or apprentice dormitories to availability.

Realization can start: autumn 2015

Languages: English or German

Budget for performances at Potsdam-Nuthetal (accommodation, local travel, food, training, and excursions) should be calculated with about 25.000€ (depending on number of students, topics and accommodation).

IGV will give an offer for more precise conditions of the required modules.

Detection of artificially contaminated UHT spray whipped cream: a challenge test (Ľ. Valík)

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Detection of microbial contamination of UHT products is an integral part of their production. It is influenced with various factors concerned mostly with type contamination, viability of the microbial cells present in a product, detection method and properties of the product.

In our study, the challenge test with whipped spray cream was performed. The UHT cream was artificially contaminated in cans with the raw milk just before the whipping. Pre-calculated levels of contamination, approx. 1 cells/mL and 10 cells/mL were confirmed by the cultivation.

The aim of our study was to consider the procedure of detection, including pre-incubation, time of incubation, and evaluate detection of microbial contamination by ATP methods (ATP I, ATP II), flow cytometry (FC) and by the rapid method detected microbial oxygen consumption (MOC).

Results

ATP I method was characterized with higher level of RLU representing the background of the sample. ATP II method showed more reliable and less variable RLU values of the background. Both, they were able to detect microbial contamination reliably at higher and lower inoculation level after 24 h and 30 h of incubation of the samples at 30 °C, respectively. However, significant correlation between the results determined by ATP I and ATP II was found ($r = 0.957$), we had to reject the null hypothesis at the 5% significance level. Both the databases were statistically different to each other. The lower RLU values by ATP I method were overestimated and higher RLU were underestimated in comparisons with RLUs by ATP II. FC and MOC provided highly correlated results to viable counts ($r = 0.953$; $r = 0.948$, respectively), but the values by MOC method were the closest to the results determined by cultivation methods. Thus the null hypothesis was not rejected only in this case by Student t method (Analyse-it, Leeds, UK).

Conclusion

Classical methods of detection of microbial contamination in whipped cream as measuring titratable acidity or pH were not suitable. Rapid indirect tests also required incubation of the samples (longer than 2 d) and provided less sensitive responses in comparison with cultivation methods. To evaluate the probability of detection of contaminated sample, the sampling plan and number of samples taken should be also considered.

Industry - University benefits

This work provided to producer information to revise control system of UHT production. The university had an opportunity to perform and evaluate the challenge test in real industrial condition. Involving the students and teachers in the project had a great impact on their experience and on improvement of teaching of the subjects such as Food Technology and Dairy Microbiology.

Amount of carotenoids in different color tomatoes (P. Viskelis)

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The most important external characteristic of tomato fruits is color. The color of fruits and vegetables results from the presence of carotenoid pigments. The measurement of color can be used in describing processes of changing fruits color, such as fruit ripening or drying. The applicability of using skin color measurements to predict changes in pigment composition was investigated using a selection and evaluation of the different colors of tomato (*Lycopersicon esculentum* Mill.) varieties for the food industry. Investigation was carried out at the Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry in the presence and acquiring skills for students of Kaunas University of Technology and industry JSC "Paslaugos žemdirbiams". Different colors of tomato fruit 'Svara' (red color fruit), 'Gold Sunrise' (yellow), 'Oranž 1' (orange), 'Black sweet cherry' (black) and 'White Beauty' (bright yellow) was investigated for lycopene and β-carotene quantities and CIELab color coordinates. Tomato fruits for analysis were picked at peak of the fruit ripping period. NIR (Near Infrared spectroscopy method based on the transmittance principle, using near-infrared wavelength spectrophotometer) and colour coordinate spectrophotometry was used in this study to simplify the determination of carotenoids without tomato damage.

It was established that red colored fruits of Lithuanian cultivar 'Svara' distinguished with the highest amount of lycopene – 9.5 mg 100 g^{-1} and tomatoes of orange color distinguished with the highest amount of β-carotene 2.56 mg 100 g^{-1}. Tomato cultivar's 'White beauty' fruits were very poor quality according to amount of carotenoids: amount of lycopene reached only 0.06 and β-carotene – 0.12 mg 100 g^{-1}. In black colored fruits amount of lycopene and β-carotene was respectively 2.5 and 3.5 times lower compared with the red ones.

It was found a strong correlation between normal and non-destructive analytical methods in measuring of soluble solids (r = 0.9251), lycopene (r = 0.8701), β-carotene (r = 0.9486), ascorbic acid (r = 0.8052), skin strength (r = 0.9906) and the pulp strength (r = 0.9369). The average correlation was observed in dry matter (r = 0.6480), titratable acidity (r = 0.5800) and total sugars (r = 0.5982) measuring. Consequently, based on the created calibration graphs can be carry out non-destructive measurements of tomato fruit quality parameters using NIR - Near Infrared Spectroscopy. The reliability assessment of the obtained results and comparison of non-destructive techniques and traditional methods, showed that there is a strong correlation between them by measuring soluble solids, lycopene, β-carotene, ascorbic acid, skin firmness and strength of the flesh, and the average correlation by determining dry matter, titratable acidity and total sugar content of tomato fruits.

Investigations were carried out for training the businesses and students to quickly and non-destructively determine the amount of carotenoids in tomato fruits, promoting the **best practices** of already existing training materials and methods, also **joint** academic/company **tutoring** and **supervision**.

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Susanne BRAUN - Managing Director of the Research Center for Bioeconomy at the University of Hohenheim, Germany. Susanne Braun has a broad knowledge in the food sector, based on an academic degree in food technology (MSc) and a second academic education in economy and European politics (MBA). Her work included international management and consulting activities within food companies in different countries. She is highly experienced in working in international research projects and is involved in the coordination and the management of EU research projects. She is member in various European food networks and associations, as e.g. EFFoST and IUFoST.

Her main activities in the recent years consisted, amongst others, in the optimisation of the knowhow transfer to SMEs in the food sector (several publications) and the linking with a trans-European network of various stakeholders in the food sector. This comprised the participation in large scale European research projects, including coordination and management activities. The work also included the organization of and participation in a big number of international conferences and workshops.

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Veronica Sanda CHEDEA graduated in 1997 as an Engineer in Horticulture from the University of Agricultural Sciences and Veterinary Medicine (USAMV) Cluj-Napoca, Romania. Between 1998 and 2000 she has followed the courses for the title of Master of Science of the Department of Natural Products of Mediterranean Agronomic Institute of Chania (MAICh), Greece. In 2009 she receives the title of Doctor in Biotechnology from USAMV Cluj-Napoca. Before and during her PhD Miss Chedea was awarded research stages in Italy, Russia and Vietnam. Dr. Chedea received prestigious grants from Romanian Ministry of Education and Research, Royal Society UK and Japan Society for the promotion of Science for three postdoctoral stages at MAICh, Greece, University of the West of England, Bristol, UK and Shimane University, Matsue, Japan. She is member of national and

international projects and director of a national project for young research teams and scientific reviewer for the journals: Food Research International, Journal of Food Biochemistry, Crystal Growth & Design, Energy & Fuels, Applied Biochemistry and Biotechnology, Journal of Bionic Engineering, Journal of Photochemistry and Photobiology B: Biology, Journal of the Serbian Chemical Society, African Journal of Pharmacy and Pharmacology, Food Chemistry, Journal of Toxicology, European Food Research and Technology. Presently she works as a senior researcher at National Research Development Institute for Animal Biology and Nutrition (IBNA), Balotesti, Romania.

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Former Head of Galenical Laboratory at Grünenthal GmbH Spain. Former Head of Pharmaceutical Technology at Glaxo SA Spain. Former Head of Galenical Research at Rhône-Poulenc Rorer SA Spain. Consultant for 15 Pharmaceutical Companies

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Julian DRAUSINGER, MSc. CEO Delegate; Secretary General Austrian Technology Platform Julian Drausinger is graduated Food technologist and has been working for 15 years in the LVA realising applied product and process development for the food industry. His involvement in a large number of national and international research projects gives him sufficient experience in the related project work. Additional expertise lies in the fields of food hygiene, product development, quality management and food standards. He is Member of

the Research Expert Group of Food Drink Europe (FDE) and Secretary General of the Austrian Technology Platform (ATP) pillar. Being responsible for training and technology transfer he has the right expertise for successful conversion of identified content to practical use on operators and users site.

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Florence DUBOIS-BRISSONNET, Full Professor in Microbiology and Food Safety at AgroParisTech

Florence Dubois-Brissonnet completed her Engineer degree at SupAgro Montpellier and her Microbiology MSc. Degree in 1987. She got her PhD in Applied Biology and Biochemistry at Reims University (France), in 1992. She belongs to the team 'Bioadhesion, Biofilm and Hygiene of Materials' in the "Food and Gut Microbiology for Human Health" Joint Research Unit INRA / AgroParisTech. She has focused her researches on adaptation and resistance of pathogenic bacteria – in particular *Listeria monocytogenes* and *Salmonella* - to conditions they encounter in complex systems such as food matrices or biofilms in food processing environments. She has developed expertise on bacterial membrane characterization to understand the mechanisms of stress adaptation and resistance. She is coordinator of the AgroParisTech MSc Program "Risk analysis in the food chain". She is member of the boards of AgroParisTech Engineer courses. Moreover, she is one of the French representatives in the COST Action FA1202 and, since 2012 she represents AgroParisTech at the ISEKI-food4 Project.

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Ertan ERMIS, MSc, PhD - Dr. Ermis was born in Turkey and studied Bachelor of Food Engineering in one of the well known universities of Turkey. After working as Food Engineer in production and sales departments of private food companies for four years, he moved to Germany to study further at Masters level. He has successfully completed the Masters programme which was about environmental protection integrated food production and obtained MSc degree from Hohenheim University. In 2007, he was accepted to one of the EU funded PhD programmes as part of Biopowders Research Trainining Network under Marie Skłodowska-Curie actions. He conducted his research at University of Greenwich and at Technical University of Munich on food particles and powder characterization. He has been working as Assistant Professor at Food Engineering Department of Istanbul Sabahattin Zaim University since 2013. He is currently teaching at undergraduate and graduate levels. His research interests are non-thermal food preservation techniques, natural food preservatives and food powders characterization.

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Martine ESTEBAN-DECLOUX - Professor in Food Process Engineering in AgroParisTech (France).

Research fields 1) Distillation: understanding in the field of potable alcohol, use of simulation (ProSim® softwares: ProSimPlus for continuous distillation and BatchColumn for discontinuous distillation) for optimization. 2) Drying in Superheated Steam (SHS drying): study of relevance of this mode of energy-efficient drying. 3) Membrane separation: research method sizing industrial scale from laboratory tests, participation work on treatment the condensates from the concentration of stillage. Studies on extraction and recovery of molecules of interest. Supervisor or co-supervisor of 20 students in PhD (4 in course). Co-author of 60 articles and participation in many conferences.

Teaching in food process engineering: distillation, evaporation, crystallization and organization of many project. In charge of the organization of the last year specialty in food science engineering.

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L.O. FIGURA - Ludger Figura studied physics and chemistry. After experience in industrial food research 1995 he went to University of Applied Sciences at Bremerhaven, Germany. Since 2008 he is teaching food engineering and food physics at University of Applied Sciences at Osnabrück, Germany which has a close cooperation to German Institute of Food Technologies at Quakenbrück, Germany. Since 2003 he is also affiliated to the Agricultural and Biological Engineering Department of University of Florida, USA. After being academic dean at the faculty of Agricultural Sciences he is academic director of the international summer lab at UAS Osnabrück which is a summer program for international students of food science and food engineering.

Research interests are on physical properties of food and its measurement like thermal properties of metastable carbohydrates and rheological characterization of disperse food systems.

2014 he was listed in Who is Who of Thermal Analysis and Calorimetry.

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Liviu Laurenţiu GIURGIULESCU, PHD ENG. WINE BIOTECHNOLOGY

Work place and function: Technical University of Cluj Napoca, Associate professor

Research domain: Food Biotechnology, Wine Biotechnology, Fermentative Technology, Microbiology, Food Safety, Food Law, Food Chain contamination with heavy metals.

Significant research projects:

1. Bioacumulation of Heavy Metals in Chain Soil-Plants-Fruits

2. Soil monitoring to rehabilitation after pollution with heavy metals

3. Ruderal plants as a source of bioactive compounds in creation of innovative food products

Society member:

Member of "Romanian Association of Food Technology Scientists– ASIAR"
Member of UNESCO cathedra "Wine and Culture" – Dijon, France, coordinator professor PHD Joceline Perard

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Christine GRABLER, MSc

Food Technology Expert, Data Research Manager

Christine Grabler is an experienced project manager with strong involvement in industry related product and process development in the food sector.

After her studies of Food and Biotechnology she graduated with distinction at the Vienna University of Natural Resources and Life Sciences in 1996. Christine Grabler started her professional life in the certification body of Lebensmittelversuchsanstalt and was occupied with organic production and later also with other inspection services, such as hygiene and private standards. This work earned her experience with quality management, regulative aspects of food production and standard requirements in production and retail.

In the course of her organization activities she developed different data storing und processing systems for the use as monitoring tools in food inspection and monitoring. In parallel her organizational skills started to become useful for the project management department, were she got involved via scientific data research and information retrieval services. Information processing in the context of industrial projects for innovative research is still a focus in the work of Christine Grabler, contributing to technology transfer activities of the Austrian TechNet.

Christine Grabler is married and mother of three children.

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Brian MCKENNA retired in 2008 as Professor of Food Science at UCD - University College Dublin, Ireland, a post he held since 1989, and became an Emeritus Professor and took up the role of scientific co-ordinator of the European Technology Platform, *Food for Life*. A Chemical Engineer by training, he worked as a Research Engineer at the National Dairy Research Centre, Ireland, before moving to an academic career. In addition to his Professorship of Food Science, he served as Dean of Postgraduate and Interdisciplinary Studies at the university from 1995 to 2000 and has served two periods as Vice-President of the university, first with responsibility for Academic Planning & Development (2000-2003) and then as Principal of the College of Life Sciences (2003 to 2008).

He was Editor of the Journal of Food Engineering from 1988 to 2007 and was President of IFSTI, the Institute of Food Science & Technology Ireland (1978-1980 and 1993-1994) and of EFFoST, the European Federation of Food Science & Technology (2005-2007 and 2009-2010). He received the EFFoST Lifetime Achievement award in 2010, the IFSTI Honorary Fellowship in 2010 and the ICEF Lifetime Achievement Award in 2011. He is a member of the Scientific Committee of the Food Safety Authority of Ireland, (1999-date) and was Board Chairman of the National Virus Reference Laboratory of Ireland, (2005-2014). He now has responsibility within EFFoST for its involvement in EU projects.

He has carried out research on physical properties of foods, rapid chilling of beef and lamb, meat texture, food safety, shelf-life prediction of foods, radio frequency heating of foods, formulation of functional drinks and drug delivery in foods. These have resulted in publication of 15 books and in excess of 200 papers

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Pilar MORAIS (MSc) has an Executive MBA from Porto Business School (2008), a MSc in Food Science (Dairy Science option) from the University of Reading in England in 1999 and a 5-year degree in Food Engineering from Escola Superior de Biotecnologia, Portugal Catholic University (1996). Pilar also has experience in the cheese, RTE foods and the fruit preparation industries. Since October 2014 Pilar is Research, Development and Innovation General Manager at Frulact.

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Paola PITTIA - Master Degree in Food Science, Faculty of Agriculture, University of Udine in 1989. Since 2004 she is Associate Professor in Food Technology disciplines at the Faculty of Biosciences and Technology for Food, Agriculture and Environment (formerly Faculty of Agriculture), University of Teramo, where she teaches courses in the Master degree programme of Science in Food Science and Technology and of Viticulture and Enology and coordinates the Master Degree programme in Food Science and Technology.

From 2013 she has been appointed as of Deputy Rector for Internationalization and Joint study programs. The scientific activity of P. Pittia is focused on aspects related to processing and stabilization of food products, to quality characteristics of technological functionality of ingredients and food components and of the design of food formulated products. She has developed main expertise on of physico-chemical properties, physical and rheological properties of foods and their changes due to processing (conventional and innovative technologies) and storage conditions. She is/was scientific referent of several research projects, national and international carried out both with public institutes and in collaboration with food industries.

Paola Pittia is co-author of over 80 papers published in scientific peer-reviewed international journals, 3 book chapters and more than 170 oral presentations and posters at national and international conferences. She acts as co-editor of two international journals (Italian Journal of Food Science and International Journal of Food Studies).

She has been involved since 2005 as partner of Erasmus ISEKI_Food projects (ISEKI-Food2, ISEKI-Food3, Mundu, and Mundus 2) and she has coordinated the Erasmus Thematic Network ISEKI_Food 4 (2011-2014).

She is currently president of the ISEKI Food Association.

She is also an “Food technologist” recognized as professional by the Italian law and registered at the Order of Food Technologists (Friuli-Venezia Giulia: 2001-2005; Abruzzo: 2005-ongoing).

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Fernando J. SADIO RAMOS

- PhD (with International Mention) – University of Granada, Spain.

- Master in Contemporary Philosophy – University of Coimbra, Portugal.

- Degree in Philosophy – University of Coimbra, Portugal.

- Associate Professor: Polytechnic of Coimbra, School of Education (Portugal).

- Member of the following Research Groups:

a) HUM-742 D.E.Di.C.A. – Development, Education, Diversity, Culture: Interdisciplinary Analysis (University of Granada, Spain).
b) L.I.F. – Language, Interpretation, Philosophy (University of Coimbra, Portugal).

- Deputy Director of the Scientific Journal DEDiCA. REVISTA DE EDUCAÇÃO E HUMANIDADES (Journal of Education and the Humanities).

- Projects (Director/ Participant):

1) *Cultural Identities: Education, Arts and the Humanities*.
2) *Folk Art and Culture.*
3) *Building Bridges towards Interculturality.*
4) *Educational Sectors and Cultural Differences of Students: Design of Pedagogical Socialization Activities.*
5) *Education without Borders: Atention to the Students' Cultures*.

- On-Going Projects:

1) Education, Art and the Humanities in a Crossroad of Cultures.
2) Non-Formal Education with Arts.
3) Life Stories and Empowerment of Senior Persons.
4) Citizenship Education with Senior Persons.
5) Higher Education Students' Attitudes towards Senior Persons.
6) Service Learning in Higher Education.

- Several publications in the areas of Education, Intercultural/ Citizenship and Human Rights Education, Service Learning, Non-Formal Education and Professional Teaching Ethics.

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Cristina L.M. SILVA - Cristina L.M. Silva is Associate Prof. at Portuguese Catholic University – College of Biotechnology (ESB). She is Chem. Eng. and PhD in Biotechnology and Food Engineering, and is involved in research on quality and safety of processed foods, with special emphasis on mathematical modelling and optimisation of the processes. Her research interests are focused on: (i) design and optimization of food process conditions; (ii) predictive microbiology as a tool to optimize food processes; (iii) evaluation of food quality changes due to conventional and novel processing; (iv) evaluation of food quality and safety changes during storage; and (v) formulation of new foods.

She has been institutional leader of several national and international projects, and coordinator of the projects ISEKI_Food 3 and ISEKI_Mundus 2 (http://www.iseki-food.eu), and FP7 KBBE project Track_Fast (http://www.trackfast.eu). She is also editor-in-chief of the International Journal of Food Studies (http://www.iseki-food-ejournal.com).

Cristina Silva is past-president of ISEKI_ Food Association (http://www.iseki-food.net), member of the executive committees of EFFoST (http://www.effost.org/) and IFA, and member of the IUFoST Education Committee.

She is currently responsible for the International Relations, coordinator of the 3rd cycle degrees, and president of the pedagogic committee at ESB.

She is also member of the European Bioeconomy panel (http://ec.europa.eu/research/bioeconomy/) and of the Task-Force – "Growing the Bioeconomy" of ICA – Association for European Life Science Universities.

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Soap factory Riesa, skilled worker for soap making (1969-1973)

IGV Institut of cereal processing, scientific collaborator (1976-…), (grain and spice analytics and processing),

1991 head of department food technology, organizer of international projects and conferences, workshops, presentations in Europe, Africa, Asia, US

2012 head of research coordination (national, EU, international)

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Editorial board member of the Journal of Food and Nutrition Research; Delegate of Slovakia in the Network on Microbiological Risk Assessment by European Food Safety Authority (EFSA); the leader of four domestic scientific projects and expert in 5 international research and consulting projects. He has more than 85 referee articles, 3 books and 2 chapters in book.

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Pranas VISKELIS, professor, doctor (physical sciences, chemistry), head of Biochemistry and Technology Laboratory, Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry. Professor at Kaunas University of Technology, Food Science and Technology Department.

Participation in the training of researchers

Scientific leader of doctoral dissertations, member of the dissertation defense board in 23 doctoral thesis.

Participation in projects

Over the past ten years participated in seven international scientific projects, in 3 national research program "Healthy and Safe Food" projects, led and carried out 26 research and development projects.

Scientific publications

368 scientific articles in English, Russian and Lithuanian languages, 54 publications that are listed in Thomson Reuters Web of Knowledge database. Author / co-author of 16 scientific books and textbook, 7 of them published in international publishing houses. h-index is 8.

Other activities

One patent, and co-author of one hybrid carrot and nine black currant varieties.

Awards

2012, Lithuanian Science Award for the cycle of "Fruit and vegetable quality and safety research: innovative technologies (1997-2011)". Honorable mention by the Ministry of Education and Science (2008, 2010) and the Ministry of Agriculture (2010) for productive scientific activities and development works.

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Romina ZANABRIA, PhD is the Food Safety Project Coordinator at the Canadian Research Institute for Food Safety (CRIFS), University of Guelph. She coordinates the efforts of industry and academia on risk mitigation strategies, promoting risk communication between the food industry stakeholders. She is responsible for the development and delivery of the Loblaw Academy for the past 2 years and is now also Instructor of the Guelph Food Academy.

Romina is also a member of the Canadian Food Inspection Agency (CFIA) – Risk Assessment Scientific Technical Group, where she provides guidance and support towards the development of the improved risk-based food inspection model, part of the Safe Food for Canadians Action Plan.

Previously, Romina worked in diverse food industries combining experience of corporate quality assurance systems, food safety, risk analysis, training, and product development. In that capacity, she provided leadership to the industry's development and implementation of programs and policies, and lead full lifecycle of laboratory research. Romina obtained her MSc. in Food Technology from Wageningen University and her PhD in Food Science from the University of Guelph. She has received several national and international awards and fellowships, including a NSERC Visiting Fellowship, the CDC and OGS scholarships, and the Netherlands University (NUFFIC) fellowship.

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