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THE ISEKI FOOD PROJECTS AND NETWORK: STRATEGIES AND ACTIVITIES TO IMPLEMENT SKILLS AND ABILITIES OF THE FUTURE GENERATION OF GRADUATES IN FOOD STUDIES

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Abstract

Food studies networks started in 1998 with a long term objective of creating effective tools and guidelines that promote the EHEA (European Higher Education Area) for food studies, and has also been disseminating it at an international level, through constant renewing networks at European level with Erasmus programme support and at International level with Erasmus Mundus programme support. All the activities, tools and materials developed are sustained by a non-profit organization, the ISEKI Food Association (IFA) that has now a worldwide network, reaching all the Continents. A variety of tools have been created which the most significant are: a number of databases of curricula, teaching materials and food industry stakeholders; an International journal and regularly published books in an international publisher; a periodic international conference on bridging education, research and industry; a quality assurance label for Food Science and Technology curricula (EQAS); partnerships in other research and education projects.

1. Introduction

The European SMEs in the food sector represent €450 billion of turnover, €95 billion of value added, 2.9 million employees and 308,000 enterprises. They account for: 48% of the F&D turnover, 48% of the F&D value added, 63% of the F&D employment and 99% of the 308,000 F&D companies (<http://smes.ciaa.eu/>; visited Dec., 2011).

Labour productivity and percentage of higher-level skilled and better paid staff is considerably lower than in most other industry sectors. Moreover, in terms of innovation performance ranking, investment in research and export/import Europe has been losing position, compared with other regions of the world.

Academic studies in Food Science and Engineering are strongly multidisciplinary comprising chemistry, biochemistry, physics, microbiology, process engineering and technology, management, logistics, market studies, informatics, etc. (Dumoulin, 2012).

Therefore, the need for well prepared food professionals, with the right skills and competencies, is a continuous challenge. Professionals in this field have to have a multidisciplinary view at European level, and good knowledge on safety, health and preference, and environmental aspects. Moreover, actual conceptions of Lifelong Learning are

focused on employability, flexible career and qualifications paths and strong connection among qualifications providers and society.

To comply with the needs and innovation demands of the food industry and to fit the job market requirements of modern skills and expertise, food studies and careers cannot be static along the time but have to progressively adapt contents and disciplines, educational approaches and methodologies.

The European Commission has been financing several international academic networks, which the objectives are towards topics related with education/training, research, industry and governments.

Particularly in the food field, the ISEKI_Food (Integrating Safety and Environment Knowledge In Food towards European Sustainable Development - <http://www.iseki-food.eu/> and - <http://www.iseki-food4.eu/>) network was initiated eleven years ago.

ISEKI_Food was designed as a network of University and Research Institutions, Professional Associations, Industrial partners and Students Associations to foster collaboration on a variety of joint interest projects. Seven European and world wide academic networks projects received funding between 1998 and 2014 from the European Commission.

The main objectives of the network are to contribute to the European Higher Education Area (EHEA) in the field of Food Studies by internationalization and enhancement of quality.

This network has been progressively expanding, demonstrating that the interconnection between research, industry and academia on food technology and engineering is more and more important for the implementation of the whole food chain, through the setting of a modern and qualified education and training framework in an international dimension.

To support the identification of the training and career requirements of future European food professionals the ISEKI_Food network was promoter of a project under the FP7 that was positively approved. The TRACK_FAST project (<https://www.trackfast.eu/>), a KBBE support action currently ongoing (2009-2013), has as main objective the identification of the educational, training and career requirements of the next generation of food scientists and technologist and the implementation of a European strategy to recruit the next generation FST leaders.

To ensure the sustainability of the network activities the ISEKI_Food Association (<http://www.iseki-food.net/>) was founded in 2005 to be a leading network for all stakeholders in the food supply chain with regard to education, legislation and communication.

2. The ISEKI_Food projects and network

The ISEKI_Food network, project by project, developed a series of activities aimed to network university and research institutions, professional associations, industrial partners and students associations and develop mutual knowledge, exchange of ideas, at a European and International level to contribute to the development of all countries, locally and everywhere, to give right answers to an international changing market (Dumoulin, 2010, *History of the Food Network before ISEKI Food* - <https://www.iseki-food.eu/node/277>).

The following figure (figure 1) presents the updated history of the ISEKI_Food network projects.

The ISEKI_Food projects initiated with the start-up FoodNET project (1998-2000) and the 56 partners have focused their activities aimed to promote initiatives that could pool together experiences from all over Europe and adapt teaching and training programmes to the future needs.

The main issues that were developed in the following editions of the projects were aimed at:

(i) to tune and align curricula in Food Studies. Main output of this activity was the agreement on food studies minimum requirements, a document that nowadays is a reference to the set up

of new curricula in Food technology or Food engineering in EU, as well as at international level. A database of curricula in Food science and technology in EU has been also developed, (ii) to support the European and international cooperation and mobility of students, teachers and researchers: a platform to support international cooperation and mobility (PICAM_Food - <https://www.iseki-food.net/picam>), several web databases for curricula, teaching materials and stakeholders (<https://www.iseki-food.net>). The aim of the latter is to maintain a worldwide network of all stakeholders in the food supply chain, who can be searched and contacted, to promote synergies between research, education/teaching and industry and to stimulate the development of joint projects or trade opportunities, (iii) to develop innovative teaching materials and methods; including the ISEKI-Food book series published by Springer, A training platform including tailor made e-learning courses, web seminars and workshops facilitating Lifelong Learning,

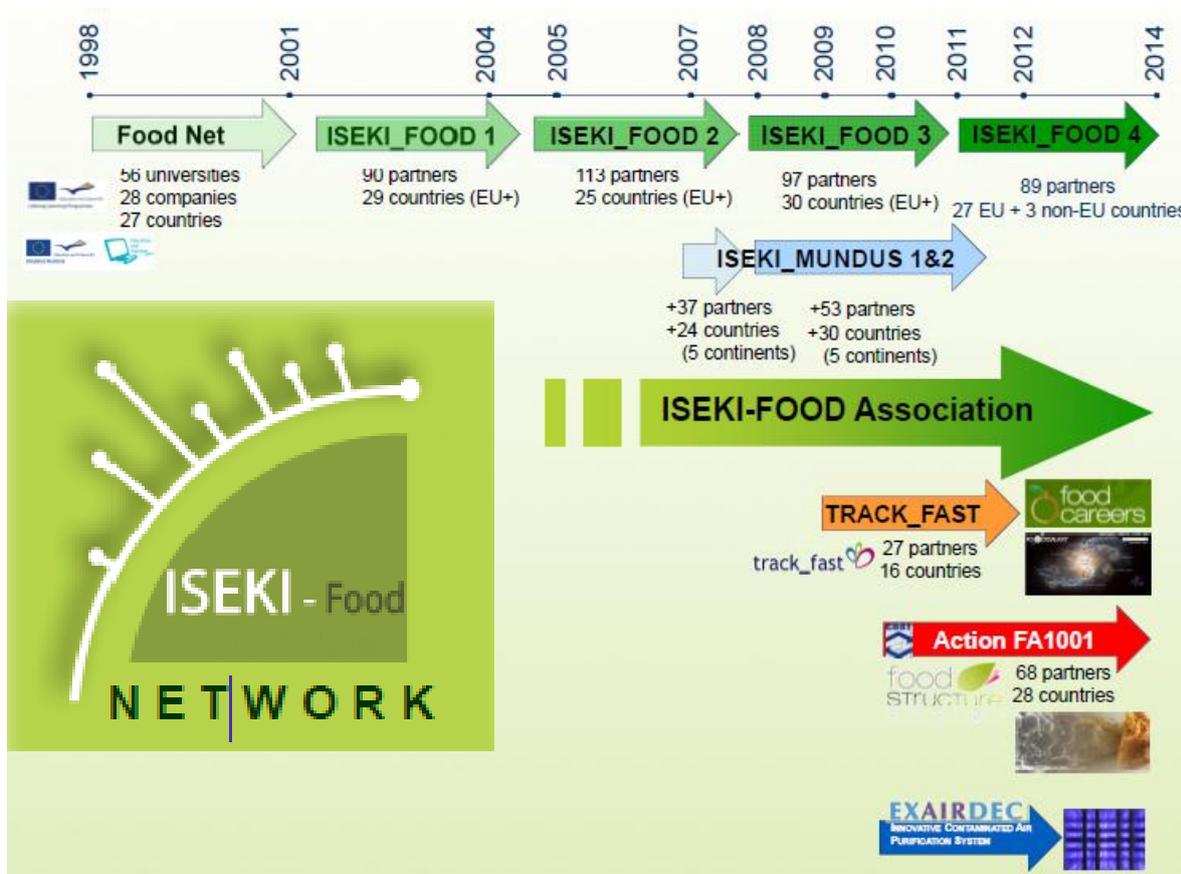


Figure 1 - History of ISEKI_Food network projects

(iv) to develop a quality evaluation system for Food curricula. A quality label was developed – the European Quality Accreditation System for Food Studies (EQAS-Food; https://www.iseki-food.net/EQAS_Food_Award). This label, managed by the ISEKI Food Association, aims to be a means of identifying high quality food studies programmes, first and second cycle, of any higher education system, European or International. To promote this quality label, the ISEKI Food Association co-founded the European Alliance for Subject-Specific and Professional Accreditation and Quality Assurance (EASPA; www.easpa.eu), an association of sector specific international quality assurance networks and international organisations with established or developing soon quality labels for their sectors, (v) to favour lifelong learning through the promotion of the recognition of prior experiential learning and employability aligned curricula and supporting the Bologna reform on the

change of a student-centred education, through the dissemination of good practices; and to develop efforts for the tuning of 3rd cycle studies (<https://www.iseki-food.eu/wp7>).

An important step of the ISEKI_Food network history was its internationalisation through the ISEKI_Mundus (2007-2008) and ISEKI_Mundus 2 (2008-2011) Erasmus Mundus projects, whose main objectives were to “foster the internationalization and enhance the quality of the European Higher Education Food Studies” and “Promotion of good communication and understanding between European countries and the rest of the world” (<https://www.iseki-food.eu>).

This allowed the ISEKI Food network to contribute towards the European Higher Education in a Global Context (http://www.ond.vlaanderen.be/hogeronderwijs/bologna/actionlines/global_context.htm), and today the ISEKI_Food network is one of the most successful EU networks, achieving significant impact through its internationalisation and communication with the rest of the world.

The currently ongoing ISEKI_Food-4 (2011-2014, www.iseki-food4.eu) is strongly committed to the modernization of the food studies and academic sector, to contribute to the innovation of the industry involved in the entire food chain, and to favour the internationalisation of the European Food studies. The current project involves a network of 89 partner from 27 EU eligible countries and 3 no-EU countries (Israel, Brasil and United States) as well as 40 associated partners 25 countries around the world.

The project based its rationale on the fact that food studies and careers have to progressively adapt contents and disciplines, educational approaches, and methodologies in order to allow the training of the food engineer of the current and future generations with innovative scientific knowledge and soft skills while keeping the peculiar multidisciplinary character of the profession. This requires (i) the development of a constructive academia-industry-research interaction to implement the educational programmes and to meet the job market skills requirements; (ii) the qualification of the academic teaching staff; and (iii) the enhanced use of innovative educational methods and ITC training tools.

Thus, the project is highly focused at the development of activities within a framework of stakeholders to lead innovation in Food studies education & training, fitting enterprises' needs, and promoting innovation in the FS&T academic sector. In particular, the activities planned are aimed to lead to the:

- Modernisation of the education in the Food Studies by the identification of the learning outcomes fitting the current industry and research needs and the implementation of training and FS&T courses. Main output of the activities developed is a toolbox on the Virtual Network Environment documents and materials along with a series of tools to implement and modernize Food Studies programs and promote their internationalization,
- Implementation of the labour market role in the 3rd level of education and promotion of the employability & entrepreneurship of the FS&T graduates and food professionals. A Virtual Platform for doctoral candidates to favor their networking and training with material useful to acquire knowledge and technology transfer skills, is currently under development.
- Lecturing qualification in particular for the teaching staff involved in the professional FS&T disciplines. Main outcome will be a qualification frame for Higher Education Teaching Staff including a Summer school.

Innovative teaching materials including smart books for students in Food studies, e-learning training courses, an a pilot Virtual lab on food processing will be also developed with the contribution of all the partners of the network.

Important exploitation outputs of the projects developed in the course of the various projects include:

- The International Journal of Food Studies (IJFS - <http://www.iseki-food-ejournal.com/ojs/> - ISSN: 2182-1054) that is an international peer-reviewed open-access journal featuring scientific articles on the world of Food in Education, Research and Industry. This journal is published twice per year and is mainly directed to scientists, technologists, researchers, teachers and students working in the food sector. All the manuscripts get a DOI through CrossRef and IJFS is being indexed in all the major scientific databases, directories and websites specific to the publishing area and of journals in Open Access.
- The International ISEKI_Food conference (<http://www.isekiconferences.com/>) already organized in 2008 and 2011, in Porto and Milan, respectively. The general aims of the ISEKI_Food conference series are to contribute to the creation of an "open" international forum for researchers, education scientists, technologists and industry representatives as well as food consumers, to promote constructive dialogue and collaboration on topics relevant to Food Science and Technology, Industry and Education and to present and disseminate the results of the activities developed by the ISEKI_Food network projects.

3. Identification of the training and career requirements of future European food scientists and technologists (FST), the FP7 'TRACK_FAST' project

Employability is a vital concern of the Bologna process and is an important subject for both the education and the employment environments. In fact, the knowledge of the employment market needs is an essential information for the Universities to define curricula and pedagogical approaches on the development of specific and personal competences that are of particular value for the employers.

Modern food and drink enterprises are now aimed to develop products with high quality and food safety standards, bringing them to the market with new added value, to invest in technology and research as well as to incorporate best practices and to foster new job profiles and new competencies in the industry. Moreover, global supply chains have developed as both a consequence and a driver of global food and drink supply, production and distribution. This implies a continuous training and curriculum development as crucial factor for the career of food professionals and, more in general, employees at all levels in the food sector.

Thus the overall objective of the TRACK_FAST project is the: "Identification of the training and career requirements of future European food scientists and technologists (FST), and implementation of a European strategy to recruit the next generation FST leaders" (<https://www.trackfast.eu/>). This has been achieved through:

- Identification and definition of personal skills requirements in food job market (<https://www.trackfast.eu/node/284>). It was possible to identify the current skills of European Food Scientists and Technologists (FSTs) in the EU, using data from 16 countries and Brainstorming Workshops were conducted in these countries to assess the skills that employers consider their FSTs currently lack. An *FST Market needs report* is being prepared, which is a proposal on the needs of employers in the various segments of the food profession in Europe including where and when such competencies should be learned, summarizing conclusions from the brainstorming workshops,
- Developments for the regulation of food science and technology professions in Europe (<https://www.trackfast.eu/node/284>). The regulated food professionals in Europe were identified and a wide discussion has been launched regarding the pros and cons of a Europe wide regulation. For this, several European entities were invited (for example, the

European consumers Association (BEUC) and the ETP Food for Life). A Europe wide survey to the food professionals was launched in 13 languages, which will allow verifying the relation between qualifications and other variables and the job-position in the careers of food science and technologists – the report will be available soon,

- Establishment of a framework for continual professional training and career development for the FST professional. A guidance document for a portfolio for continual professional training was created and a web portal developed. (<https://www.foodcareers.eu/>). A certification scheme for continual professional development (CPD) has been developed. The CPD scheme examines measures, procedures and standards for the implementation of a European Continual Professional Development certification system for food professionals. The scheme builds on the CPD Portfolio and the review of the needs of current European FST Employers.,
- Motivation of young people to enter and pursue of a career in food science and technology in Europe. A public discussion was made on good examples in disseminating Food Science and Technology courses and attracting students. Also, relevant material has been collected and is available on the website developed and aimed at young people (<http://www.foodgalaxy.org/>).

TRACK_FAST is built on the assumption that restoration and maintenance of EU's food industry leadership in the global economy can only happen through promoting a higher degree of innovation and competitiveness in the food sector. This will be achieved by a profound change in Europe's food workforce and in its employers.

TRACK_FAST is focused on training food professionals and supporting their career development as a way to: i) boost industry competitiveness and ii), in the long run, to attract high potential young individuals to careers in Food Science and Technology.

4. The ISEKI-Food Association (<http://www.iseki-food.net/>)

This association is an outcome of ISEKI_Food projects, founded in 2005 to guarantee the sustainability of all the results from several projects after the financial support of the European Commission. The organization currently has more than 226 individual and 36 company members from 61 countries around the world, and focuses on promoting synergy between research, education/teaching and industry with respect to Food Science and Food Technology, promote global food quality assurance, development of a virtual community of experts in the field of food, with communication to the general public, establish a framework of agreements among partners, fostering the mobility of students and staff, and create internal bodies that promote the integration of science and engineering knowledge into the food chain and to recognize outstanding achievements in food sciences through the ISEKI Academy (<https://www.iseki-food.net/node/2891>).

Several Special Interest Groups SIGS have been developed inside IFA Association. The SIG's are offering a forum for IFA members -and non-IFA members- with similar goals, to stimulate the development of new projects and activities, and to establish a network of experts from Universities, research institutions and companies in the food chain. Objectives are both oriented to research and education fields (<https://www.iseki-food.net/sigs>). At the moment there are 4 SIG's operating: 1) Food Structure and Physical Properties; 2) Bionanotechnology; 3) Networking (Promotion of Information and Networking on Research and Education Programs; and 4) Bioactive compounds. Examples of the outcomes are projects

(<http://www.foodstructuredesign.net/>), workshops, and webinars (<https://www.iseki-food.net/List-of-Webinars>).

IFA is also open to subsections outside Europe. The first one, the IFA-Indonesia subsection (<https://www.iseki-food.net/Indonesia>), began in 2011 when a group of Food Technologist met at Universitas Pelita Harapan in Tangerang, Indonesia to discuss the formation of a professional Indonesian association under the main Iseki- Food Association Europe. The Association was established as a networking association to become an organization that provides information about Food technology and its associated industries in Indonesia and/or in Asia. The association also aims to promote and encourage research and interest in the food technology fields, and also to introduce the food science and technology in Indonesia to the world.

5. References

Dumoulin, E. (2012). Changes and perspectives in Food Studies. *International Journal of Food Studies*. *In press*.