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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Slovenia, Ljubljana, 27 & 28 September, 2012
### Food Industry in EU: employment and turnover of food industry

<table>
<thead>
<tr>
<th></th>
<th>Micro</th>
<th>Small 10 to 19</th>
<th>Small 20 to 49</th>
<th>Medium sized</th>
<th>SMEs</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Turnover</strong></td>
<td>%</td>
<td>6.7</td>
<td>5.0</td>
<td>9.6</td>
<td>26.8</td>
<td>48.2</td>
</tr>
<tr>
<td><strong>Value added</strong></td>
<td>%</td>
<td>9.2</td>
<td>6.0</td>
<td>9.1</td>
<td>23.5</td>
<td>47.7</td>
</tr>
<tr>
<td><strong>Number of employees</strong></td>
<td>%</td>
<td>16.3</td>
<td>9.5</td>
<td>11.7</td>
<td>25.3</td>
<td>62.8</td>
</tr>
<tr>
<td><strong>Number of companies</strong></td>
<td>%</td>
<td>79.4</td>
<td>10.5</td>
<td>5.6</td>
<td>3.6</td>
<td>99.1</td>
</tr>
</tbody>
</table>

Key figures by company size (%)

Source: [http://smes.ciaa.eu/](http://smes.ciaa.eu/) visit 31 July 2012
Employment and turnover of food industry by country

Productivity of food industry in EU countries

The food industry has the largest annual sales turnover of any manufacturing activity worldwide and many analysts consider it now as a mature industry.
Evolution of the food industry and shift of target in food processing

Aguilera J. (2006)
Education: Food related-study programmes in EU

**Bachelor degree:** > 210

Leading countries (n.): DE, ES, IT, P

**Master degree:** > 200

Leading countries (n.): IT, PT, UK, DK

**PhD:** > 70

(track_fast & ISEKI_Food collection data, 2012)
Education: Food related-study programmes in EU

Bachelor programmes:

- FST, FS, FT, FE, Biotech, Viticolture & Oenology, Processes of Animal products, Nutrition & FS, Process Eng – FT, Engineer Agronomist, ...
- Food Innovation Management, Food Innovation, Food Service, Gastronimic Sciences, Food & Business, ...

Master programmes:

- FS&T, FS&Eng, Industrial Biotech, Innovative Enology, Food microbiology, Food chemistry, Life science Technology, Agrofoodchain
- Food enterprise development, Food Business, ...

(Track fast & ISEKI_Food collection data, 2012)
Comments

- Large variety of Food related courses
- Diverse origin of the Food related courses in the various countries

- Bachelor, Master, Phd = three level (Bologna) system

- Generic vs sector/specialisation specific/oriented (bio-, wine-, animal)

Different skills and knowledge of graduates = different initial working positions

Different teaching approach and learning outcomes
Comments

- Few new “food” related curricula (especially at Master level): gastronomy & health, ....

- Few EU master courses

New curricula for new jobs

Constraints to joint degrees between HE from different countries
Key characteristics of graduates in Food Studies

- Food science, technology/engineering, ...
- Technical speciallity
- Education and Training
- Ethical & society Impact/role of profession
- Multidisciplinary Transdisciplinary
Main training and educational goals of HE institutions

While facing issues like.....

- New generation of students
- Internet-social network
  - Web 2.0 generation
- Lower financial support to HE
- Resistance to changes
- ...lower importance of Food Science and Technology studies/curricula
- Competition from other scientific fields

• Quality standards (certification, label)
• Internationalisation
• New skills for new jobs
• Lifelong learning and continual professional development
Evolution of the food industry: from traditional to modern, for better health and safety.

Generic Food Science/Technology/Processing/Engineering

Sector specific (dairy, meat...)

Product Engineering
- Colloidal chemistry
- Food physics
- Polymer science
- Imaging techniques

Health/functionality/bio-eng, ...

Aguilera J. (2006)
New skills for new jobs?

Job offers (taken from various websites...)

Senior Product Technologist
New Chef de Vente Régional
Development Manager
Int. Senior Product Manager
Industrial by –products sales Head
Process improvement Manager

Sales Development Manager
Manufacturing Management

R&D / Lab Food Technologist
Quality assurance officer
New skills for new jobs?

New technical skills

Basic:
- ICT
- Quality & Sustainability

Strategic:
- Agri-food economy and economic efficiency
- Food product design
- Research & development
- Food safety
- Marketing distribution and communication
- Production efficiency
- ....
New skills for new jobs?

Soft skills and personal behaviour!

- Communication
- Team-working ability
- Problems solving
- Foreign languages
  ...

New skills for new jobs?

Germany: What skills and qualifications are employers looking for?

<table>
<thead>
<tr>
<th>What employers are looking for in job applicants</th>
<th>Criteria that put a candidate out of the running</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality</td>
<td>Lack of practical experience</td>
</tr>
<tr>
<td>Practical experience</td>
<td>Lack of soft skills</td>
</tr>
<tr>
<td>Command of English</td>
<td>Inadequate technical knowledge</td>
</tr>
<tr>
<td>Knowledge of computers</td>
<td>Poor match with corporate culture</td>
</tr>
<tr>
<td>International experience</td>
<td>Unsatisfactory grades</td>
</tr>
<tr>
<td>Grade on final exam</td>
<td></td>
</tr>
<tr>
<td>Type of degree (bachelor’s, master’s, diploma)</td>
<td></td>
</tr>
<tr>
<td>Duration of course of study</td>
<td></td>
</tr>
</tbody>
</table>

Source: Study by Universum Communications and access KellyOCG for Wirtschaftswoche, April 18, 2011

Focus of the debate at German universities

Becker, TechnoTN-STEM workshop, 2012
Current “hot” issues of the food chain

- Increasing population
- Globalisation (raw materials, market and production)
- Financial and economic crisis (EU, in particular)
- Food security
- Food safety
- Sustainable development and ecological integrity

*while keeping and accomplishing*

- Quality and safety
- Modernisation
- Innovation
- Sustainability
Main training and educational needs of professionals and scientists in the Food sector

- Hard-technical skills (basic-medium-advanced knowledge)
  - Change of the importance of the main areas: from Quality and Safety...to health and wellness ...to nutragenomics and metabolomics.
- Technology transfer
- ...personal (or soft) skills!
Food professional career path

**Career Development**

- **work experience**
- **Planning**
- **Training**

**Higher Education**

- **BSc** → **MSc** → **PhD**

**Industry**
- Governmental
- Research
- Consultancy

**Family Life and Basic Studies**

**Choice of area of studies**

Food Professional Food Scientists
Food Technologist, ...
Food sector, chain and stakeholders
Education: goals and responsibility

To improve and to allow the development of the society by

- transfer of knowledge
- development of skills and expertise of students and trainees, meeting the expectations of
  - consumers
  - job market
Education: engagement

Teaching and learning are human activities involving several actors with different backgrounds, different expectations and responsibility.

This is of pivotal importance in the context of the Higher Education in Food Studies, with stakeholders that are, researchers, academic staff, professionals, industry, societal representatives and students.
Food professional career path

**Choice of area of studies**

**Family Life and Basic Studies**

**Industry**
- Governmental
- Research
- Consultancy

**Higher Education**

**Career Development**
- Work experience
- Planning
- Training

**BSc** → **MsC** → **PhD**

**Food Professional Career Path**

**How to deal with the main changes occurring in the food sector?**

The “ISEKI_Food” network approach
Objectives for the development of a network of Universities and stakeholders in the Food area in EU

Academic studies in Food Science and Engineering are strongly multidisciplinary: chemistry, biochemistry, physics, microbiology, process engineering and technology, management, logistics, market studies, informatics...

That gives a full justification to organize a network of universities dealing with Food Studies, with different specialities, but all working for the same aims: education and research for the benefit of consumers through food industry.

.....

Our role and duty as researchers and teachers is to develop mutual knowledge, exchange of ideas, at a European and International level to be able to participate in the development of all countries, locally and everywhere, to give right answers to an international changing market.

The Bologna process (1998) is the product of a series of meetings aimed to the creation of the European Higher Education Area by making academic degree standards and quality assurance standards more comparable and compatible throughout Europe, in particular under the Lisbon Recognition Convention, in order to:

- Harmonise architecture of study programmes and favour students mobility
- Enhance the employability and mobility of citizens
- Increase the international competitiveness of European higher education.

2010: 47 countries, new goals for 2020
- Education, Research & innovation
- International Openeness
- Mobility
The history of the ISEKI_Food projects....


Integrating Safety and Environment Knowledge In Food towards European Sustainable Development

Integrating Food Science and Engineering Knowledge Into the Food Chain

Internationalisation Sustainability and Exploitation Innovation
Food professional career path

- **Family Life and Basic Studies**
- **Choice of area of studies**
- **Higher Education**
  - **Area Implementation**
  - **Industry**
    - Governmental Research
    - Consultancy
  - **Career Development**
    - Work experience
    - Planning
    - Training
  - **Food Professional**
    - Food Scientists
    - Food Technologist, ...
  - **BsC** → **MsC** → **PhD**
Main objectives and activities of the past ISEKI_Food projects

- **Education and Training**
  - Implementation of the Bologna process
  - Tuning curricula in Food Studies and Minimum Requirements
  - Innovative teaching and training materials
  - Quality assurance of European Food Studies

- **Development of interfaces and promote synergies** between research in Food Science and Engineering with Education/Teaching and Industry

- **Establish communication** with the general public and the consumers
- **Virtual community** of experts in the field of food
Main outcomes of the past ISEKI_Food projects

**Education and Training**

- Tuning curricula in Food Studies and Minimum Requirements (reference document for new curricula in FST)
- Innovative teaching and training materials
- Quality assurance Label of European Food Studies (EQAS)

**Education-Research-Industry interactions**

- e-journal
- ISEKI_Food Conferences
- Innovative teaching and training materials

....
Food professional career path

**Choice of area of studies**

- Family Life and Basic Studies
- Industry
  - Governmental
  - Research
  - Consultancy

**Higher Education**

- BsC
- MsC
- PhD

**Career Development**

- Planning
- Training
- Work experience

**Area Implementation**

Food Professional
- Food Scientists
- Food Technologist, ...
Actions and ongoing projects

ISEKI_Food-4: Towards the innovation of the Food Chain through the modernisation of Food Studies
IFOOD4

Erasmus Academic Network
51815-LLP1-2011-1-IT-ERAMUS-EW
1 October 2011- 30 September 2014

86 EU partner from 27 eligible countries
3 no EU partners
+ 42 associated partners from all over the world

www.iseki-food4.eu
IFOOD 4 - Main objectives and expected outcomes

- **Modernising and upgrading** the education and training of Food studies

- **Implementing the labour market role** of the **third level of education** (PhD programmes, in particular) in promoting the employability and entrepreneurship of the graduated FS&T and Food professional

- **Lecturing qualification** of university teaching staff

Toolbox for modernisation and internationalisation of Food curricula

Virtual platform for PhD students and courses

Teaching staff framework and pilot summer school
Food professional career path

Choice of area of studies ➔ Higher Education ➔ BSc ➔ MSc ➔ PhD ➔ Work experience ➔ Industry, Governmental, Research Consultancy, ...

Family Life and Basic Studies ➔ Food Professional Food Scientists Food Technologist, ...

Skills and Competences
Workforce with high potential individuals
Actions and ongoing projects

**TRACK_FAST (www.trackfast.eu)**
Training Requirements And Careers for Knowledge-based Food Science and Technology in Europe
FP7 KBBE 227220
September 2009 – February 2013

*track_fast*
Europe’s Food Science and Technology on a Fast Track
“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”.

- Update education/training based on actual and future food job market needs
- Establishment of a framework for continual professional training and career development for the FST professionals
- Promotion of FST to attract students
- Regulation of FST professions in Europe
Identification and definition of personal skills requirements in food job market
  - Survey to stakeholders, brainstorming workshops

Developments for the regulation of food science and technology professions in Europe
T_F – Activities and expected outcomes

✓ Establishment of a framework for Continual Professional training and career development for the FST professional.

www.foodcareers.eu
Foodcareers

European network for continual professional training and career development for the Food Professional

Join us!

latest news
Publication of Knowledge and Skills draft document version 2.0
03.2012
A new version of the publication on knowledge and skills requirements for careers in the food industry is available for download.
Read more

upcoming events
PAS 220 : 2008 & FSSC 2200
Read More

Pos-graduated in Enology
Read More

who’s on-line
There are currently 0 users and 2 quests online.
T_F – Activities and expected outcomes

✓ Motivation of young people to enter and pursue of a career in food science and technology in Europe.

www.foodgalaxy.eu

To show prospective students

Food Science is a real science with real challenges

Careers in Food Science and Technology
Food production and processing

Studying food science and technology

Nutrition
Experiments with food
High pressure
Health ingredients
Food science, engineering and technology
Waste management

Highlights

Food & Religion

Wed, 21 Mar 2012

Lifestyle and food habits have been encoded and regulated by belief and religion for centuries. This choices might have a biological base, but their strength resides in their
Sustainability of the ISEKI_Food project:
ISEKI_Food Association

www.iseki-food.net

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tel: +43-1-47654-6294, fax: +43-1-47654-6289
e-mail: office@iseki-food.net

President: Richard Marshall
Vice-President: Paola Pittia
Past-President: Cristina L. Silva
IFA is an independent European non-profit organisation, founded in 2005 as an outcome of 10 years of Thematic Network activities for all stakeholders in the food supply chain with regard to education, research, legislation and communication.

226 individual and 36 company members from 61 countries around the world

1 sub-section: Indonesia
is a platform for:

promoting synergies between research, education and industry
EDUCATION/RESEARCH/INDUSTRY INTERFACES TOWARDS THE INNOVATION OF THE FOOD CHAIN
EDUCATION/RESEARCH/INDUSTRY INTERFACES TOWARDS THE INNOVATION OF THE FOOD CHAIN

INDUSTRY

EDUCATION & TEACHING

FS&T students and graduates

FS&T associations

Policymakers

RESEARCH

WIDER COMMUNITY
EDUCATION/RESEARCH/INDUSTRY INTERFACES TOWARDS THE INNOVATION OF THE FOOD CHAIN

- Further approaches and tools under evaluation for further projects
  - Development of FS&T HE programmes meeting society and job market expectations
  - Implementation of the role of industry in training and teaching to favour the development of the desired and required skills
  - Implementation of interactions with the other policymakers
  - Internationalisation
  - Continual professional development and certification
Thank you for the kind attention

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(New) skills to meet job market requirements

Top Food (sector-specific) skills in currently employed FSTs

- Food Safety Management, Hygiene & Safety Control
- Product Development
- Quality Management, Assurance & Control
- Production Management/Operations
- Food Legislation & Control
- Research

Source: FP7 Track Fast project, 2012
(New) skills to meet job market requirements

Top Soft Skills in currently employed FSTs

- Communicating
- Managing Information & Computer Literacy
- Working With Others
- Participating in Projects & Tasks

Source: FP7 Track Fast project, Flynn et al. 2012