Session 4 – *UNIVERSITY AND INDUSTRY – THE STUDENTS AS HUMAN CAPITAL FOR THE FUTURE*

The New Food and Drink Professional
the role of TRACK_FAST project

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International Seminar in University-Industry Partnerships
Porto, 5th December 2012

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SEVENTH FRAMEWORK PROGRAMME

Training Requirements And Careers for Knowledge-based Food Science and Technology in Europe

TRACK_FAST

FP7 KBBE 227220

Program

Food, Agriculture and Fisheries, and Biotechnology

Knowledge-Based Bio-Economy (KBBE)

Call FP7-2008-KBBE-2B

Area 2.2.3
Food Processing

KBBE-2008-2-3-03
Training and career development
for future food scientists

Objectives

Identification of the training and career requirements of future European food scientists and technologists (FST)

Implementation of a European strategy to recruit the next generation FST leaders

Context

FOODDRINK EUROPE

Annual Report 2011

<u>European Food Sector</u>:

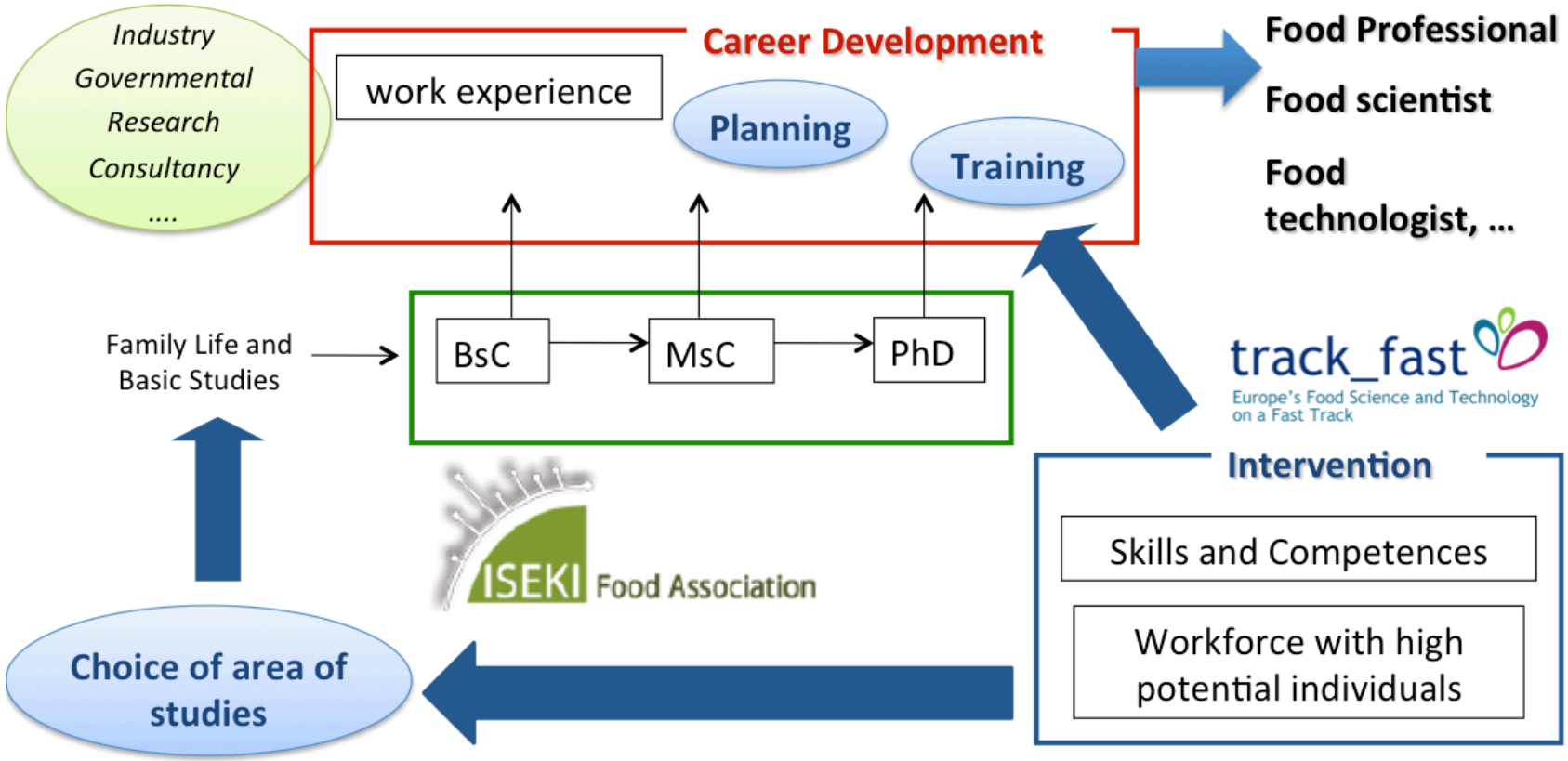
- Employs 4,1 million people in 274,000 companies - *Leading employer in the EU manufacturing sector (14.6%)*
- Fragmented industry, being 99,1% SME's - *48.7% of food and drink turnover; 63.0% of food and drink employment*
- Purchases and processes 70% of EU agricultural production
- Annual turnover of €956,2 billion - *Largest manufacturing sector in the EU (16.0%)*
- Exports €65,3 billion to third countries - *EU market share in global exports 17.8%*

Context

HOWEVER:

"Students tend to believe that a career in F&D is not an attractive choice, and the best and brightest science students choose other career paths. "

Context


Industry
Governmental
Research
Consultancy
....
Career Development
work experience
Planning
Training
Food Professional
Food scientist
Food technologist, ...
Family Life and Basic Studies
BsC
MsC
PhD
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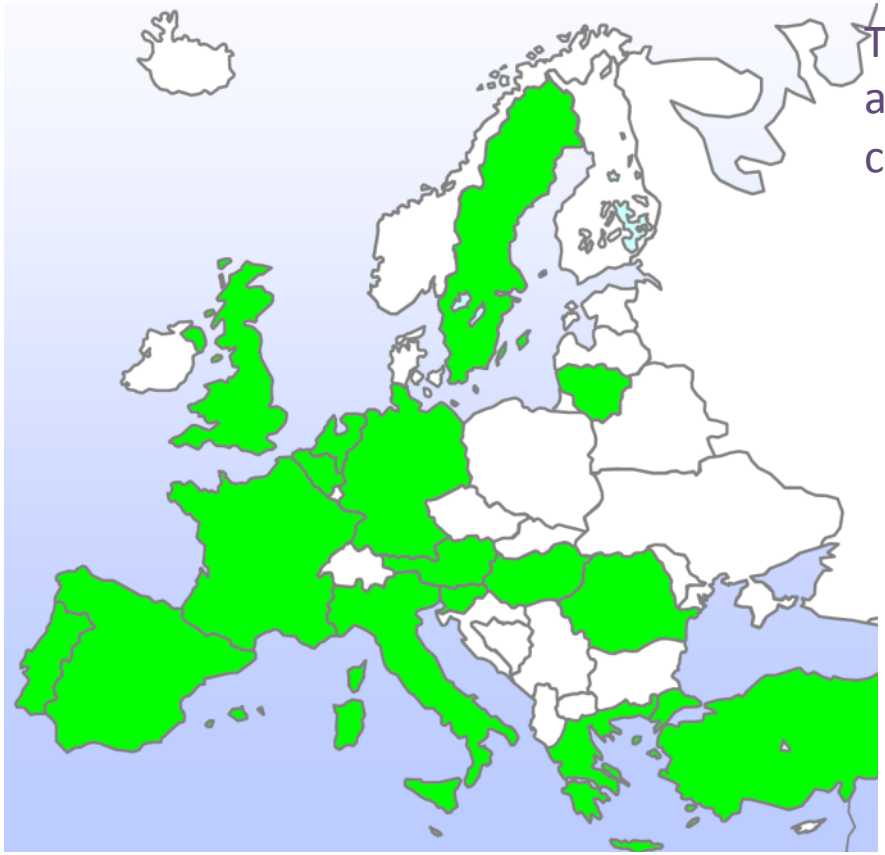
Intervention
Skills and Competences
Workforce with high potential individuals
ISEKI Food Association
Choice of area of studies

Consortium



TRACK_FAST provides main stakeholders with a forum within which their main needs are considered

- representatives of European and national professional organisations,
- research centres,
- academic bodies,
- multinational companies,
- SME associations,
- associations specialized in training members for the food industry,
- quality assurance experts.

Consortium


EFFoST, The Netherlands
Unilever, The Netherlands
FEVIA, Belgium
SAFE, Belgium
UGent, Belgium
UL, United Kingdom
Agroparistech, France
FIPA, Portugal
ESAC, Portugal
ESB-UCP, Portugal
IPVC, Portugal
AINIA, Spain
UPV, Spain
UNIBO, Italy
UNITE, Italy
NTUA, Greece
USAMVB, Romania
UG, Turkey
CUB, Hungary
UL BF, Slovenia
ISEKI FOOD Assoc. Austria
BOKU, Austria
KTU, Lithuania
TUB, Germany
ASIIN, Germany
KI, Sweden
SIK, Sweden

Logical Framework

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

Regulation of FST professions in Europe

Promotion of FST to attract students

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>>> Outcomes

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>>> Identification and definition of personal skills requirements in food job market

OBJECTIVES

1) *Which competencies should a FST have to be competitive in the job market and to provide the skills needed by employers?*

2) *What profile would be most desirable - that is what skills, knowledge and competencies are found in the "ideal FST"*

3) *How and when should these competencies be acquired?*

Highlights

- Employers of food scientists & technologists (FSTs) told us which skills they desire
- “Communicating” was the no. 1 skill desired by all FST employers
- Training in communication skills should primarily take place in school, before and during university, but the suggested frequency of such training was close to “continuous”, indicating that education during work life is also important for this skill.

Highlights

- “Thinking & Solving Problems ” was the no. 2 skill desired by all FST employers
- Problem solving skills should be learned outside of the workplace, essentially before working life begins, while communication skills may have some workplace-specific components which are taught by the employer
- Overall, “soft” skills are more in demand than food sector specific skills

Highlights

- “Product Development” was the no. 1 food sector specific skill
- This skill should primarily be learned in the workplace, but preceded by university training
- Desired skills varied by geographical region, FST level and employment area
- All employers in all areas mentioned soft skills much more than food sector skills. This may reflect a general satisfaction with the food sector-specific skills found in current FSTs

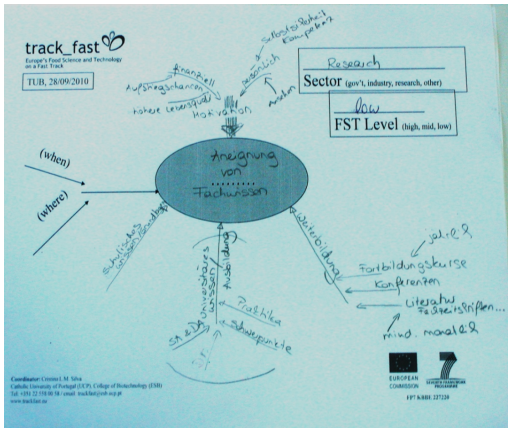
Highlights

- The comparison with the current situation showed that in general FSTs have the skills that are considered ideal. This is good news!

- However, current FSTs have almost the same competence in soft and food specific skills while, ideally, FSTs should have many more soft skills. The message seems to be that we need more soft skills and more varied soft skills

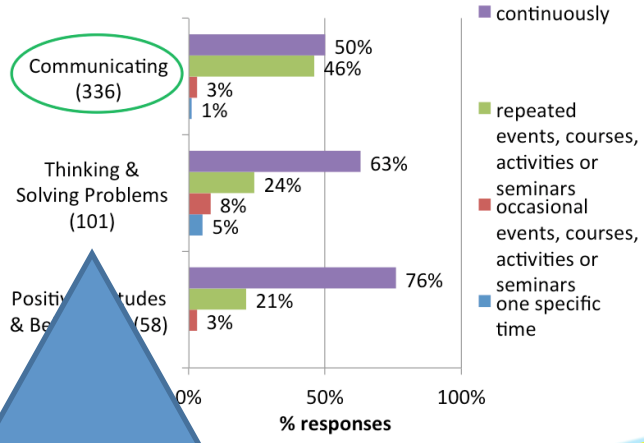
Source: D1.3: **FST Market Needs Report**

→ Which competences ?



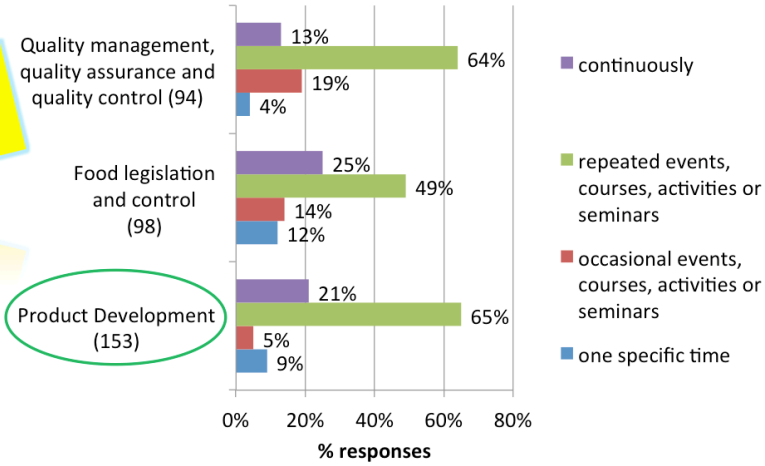
→ Where, when, how, how often?

TOP 3 Soft Skills



there is a need to promote the acquisition of soft skills

Food Skills



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>>> Developments for the regulation of food science and technology professions in Europe

ISEKI Food Association Workshop
Food Professional Regulation in EU

Wednesday 31st August 2011
Great Hall of the University of Milan,
via Festa del Perdono 7, Milan, Italy

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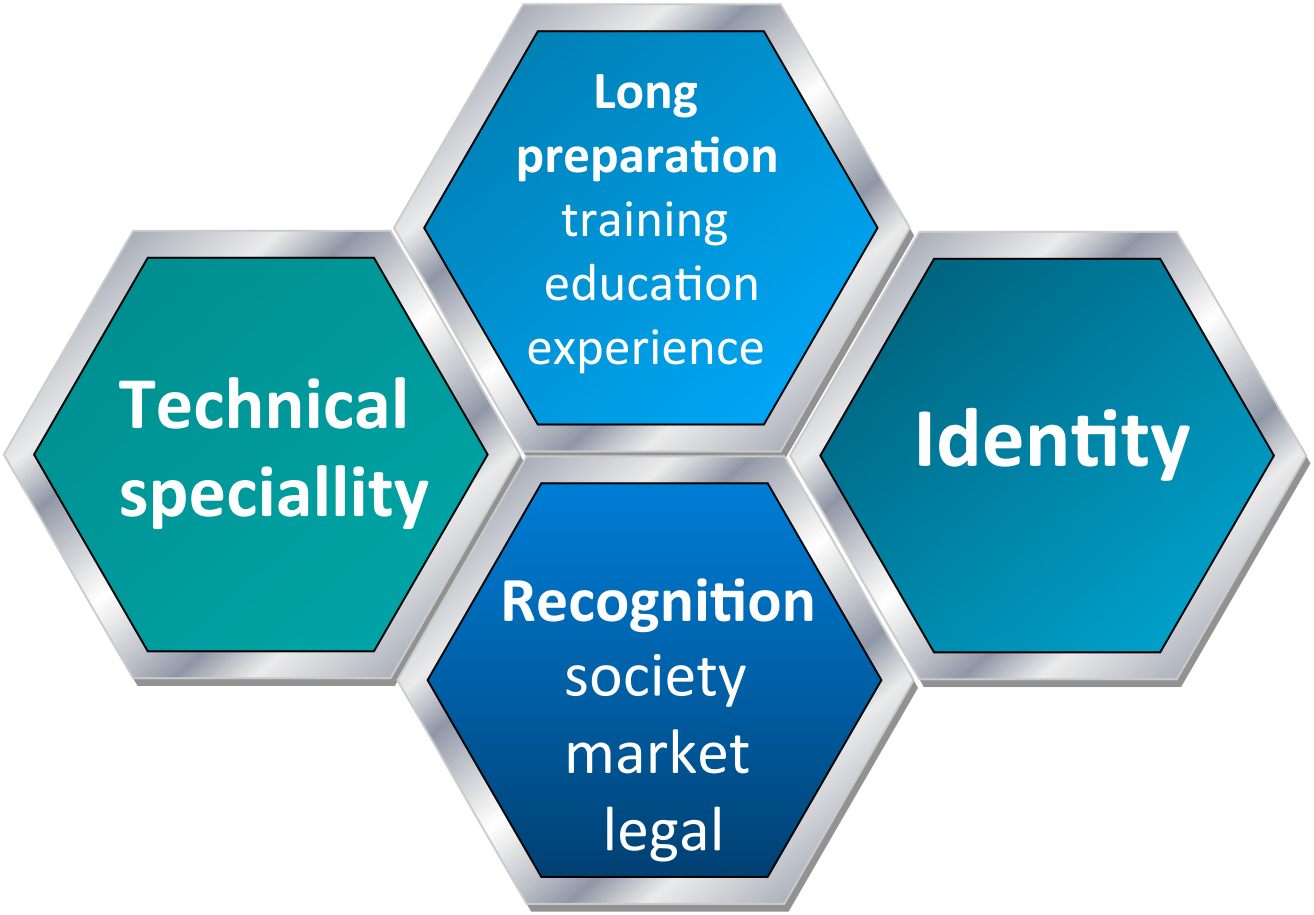
Long
preparation
training
education
experience
Technical
speciallity
Identity
Recognition
society
market
legal

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Highlights

- From the whole work performed it was concluded that the issue about regulated professions in the field of food science and technology in Europe is important and it needs an improvement. However, it is evident also that this is a complex task

- At the same time there is also a debate about the possibility to deregulate the professions, with the idea that this will decrease the costs of regulation, remove the informational barriers and complex formal procedures and thus increase competition that will generate quality and liberate transfer on the international job market

Logical Framework

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

~~Regulation of FST professions in Europe~~

Promotion of FST to attract students

Highlights

- Europe presents a profile of apparently heterogeneous education at the level of comprehensive training related to the field of food processing. In most countries diplomas in food technology are offered, while in other countries the training offer is essentially in food engineering.

- The TRACKFAST consortium advocates a common professional identification for food science and technology education in Europe for further clarification of the labor market, increasing international mobility professionals and creating structures that enhance the quality and attractiveness of these professionals

Comparison of actual with recommended career paths

Survey

Actual career path
Basic background data
Selected parameters for career path characterization
Education and training through the career path

Workshops/Survey

Recommended career path
Top skills and top food skills demanded by the employers
Where and when (frequency) the skills have to be acquired.

Low Responsibility Level (LR)
Responsible for a scope of activities under the direction of others

Medium Responsibility Level (MR)
In charge of leading a group of persons

High Responsibility Level (HR)
In charge of leading the company

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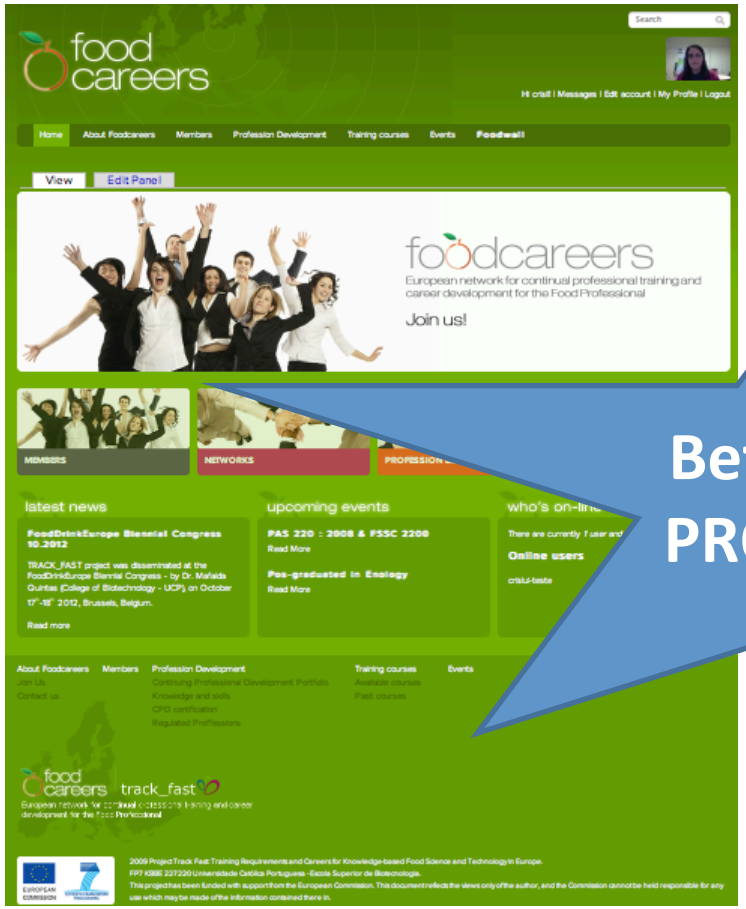
>>> Establishment of a framework for continual professional training and career development for the FST professional

→ **Continual professional training and career development (CPD)**

www.foodcareers.eu



Better prepared PROFESSIONALS

ISEKI - Food Association

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AIMS:

bringing together graduates and professionals working in the food sector, both in industry and academia (**social networking**)

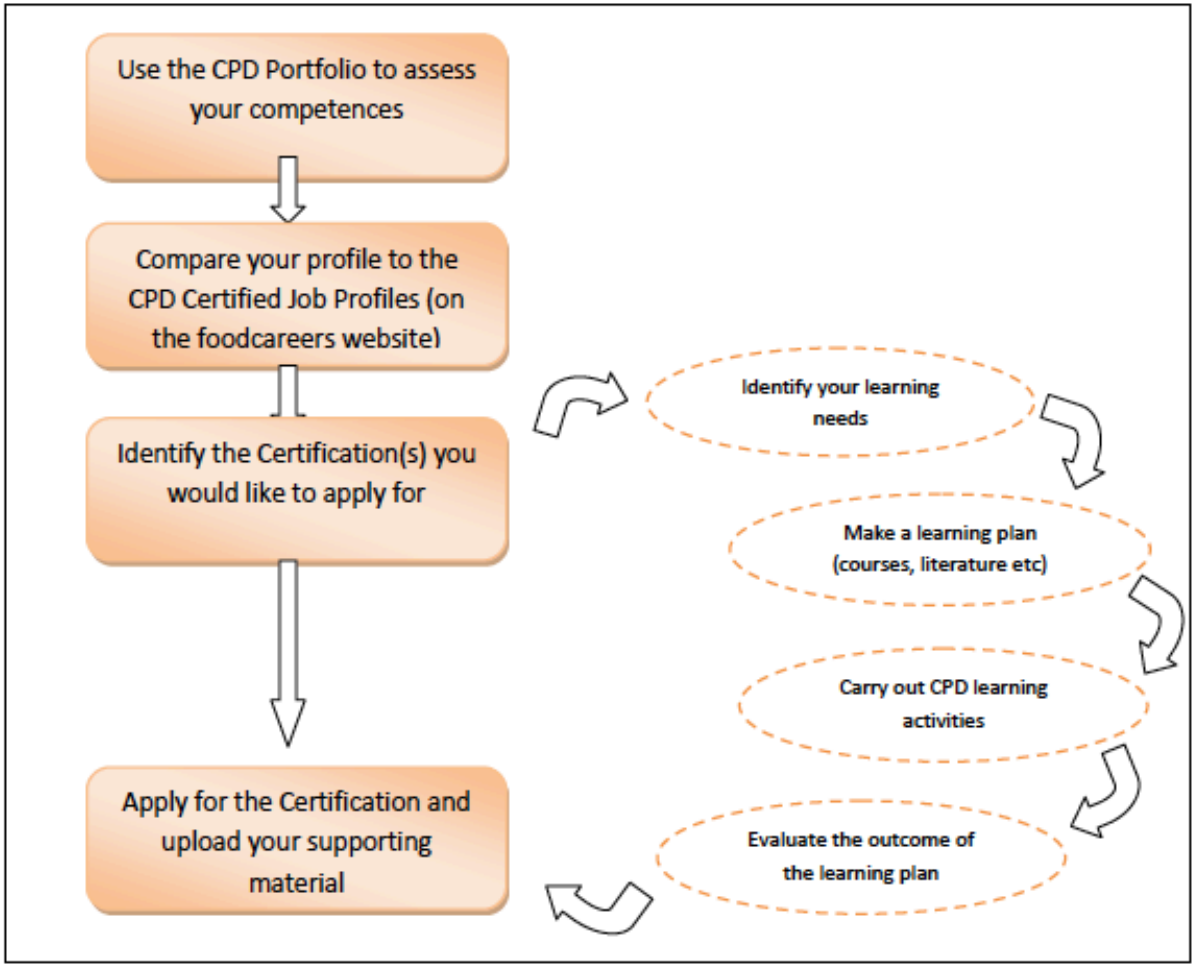
creation of an online network for continual professional training and career development for Food Scientists and Technologists in Europe (**information on training**)

social networking and providing the guidance and tools for creating and maintaining a **continual professional development portfolio**

How does it help the food professional?

- The on-line Continuing Professional Development Portfolio
- Information on training
- Social Networking

→ Development of a certification scheme for Continual Professional Development programmes



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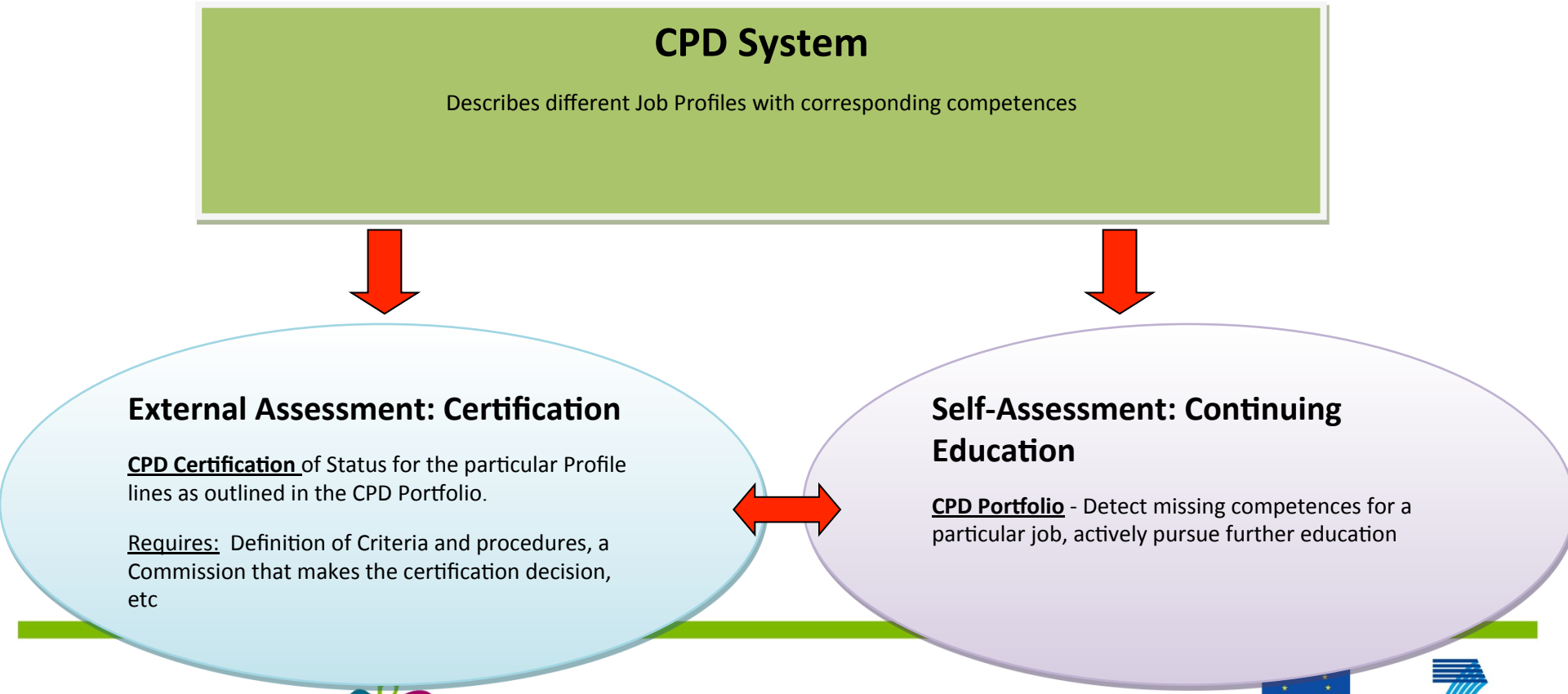
- Development of a certification scheme for Continual Professional Development programmes

"As a food professional, you may want more than just creating a CPD portfolio which can help you in your next job. You want a certificate which proves that you have the required skills and competences for a particular job anywhere in Europe. One of our aims is to propose and develop a **European certification scheme** for food careers. The assessment of your CPD portfolio will form part of the process for certification." (https://www.foodcareers.eu/cpd-certification)

- Development of a certification scheme for Continual Professional Development programmes



Draft standards for the Certification of Continual Professional Development (CPD) for the Food Professional

- two important sectors: Food Quality & Food Safety, Research & Development
- each divided into three levels of responsibility: 1-low, 2-medium, 3-high

  A total of 6 "Job Profiles" under the CPD Certification Scheme

  Each "Job Profile": associated with a set of qualifications that a candidate must have

Job Profiles

- **Food Quality and Safety Professional**
  - The Certified Food Quality Technologist
  - The Certified Senior Food Quality Technologist
  - The Certified Food Quality and Safety Manager
- **Food Product Development Professional**
  - The Certified Food Product Development Technologist
  - The Certified Senior Food Product Development Technologist
  - The Certified Food Product Development Manager

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

→ www.foodgalaxy.org

Food Science is a **real science with real challenges**

EFFoST

Food Science is a **fun – targeting a "younger" audience**

A career in Food Science is a **challenging and rewarding**

MORE PROFESSIONALS

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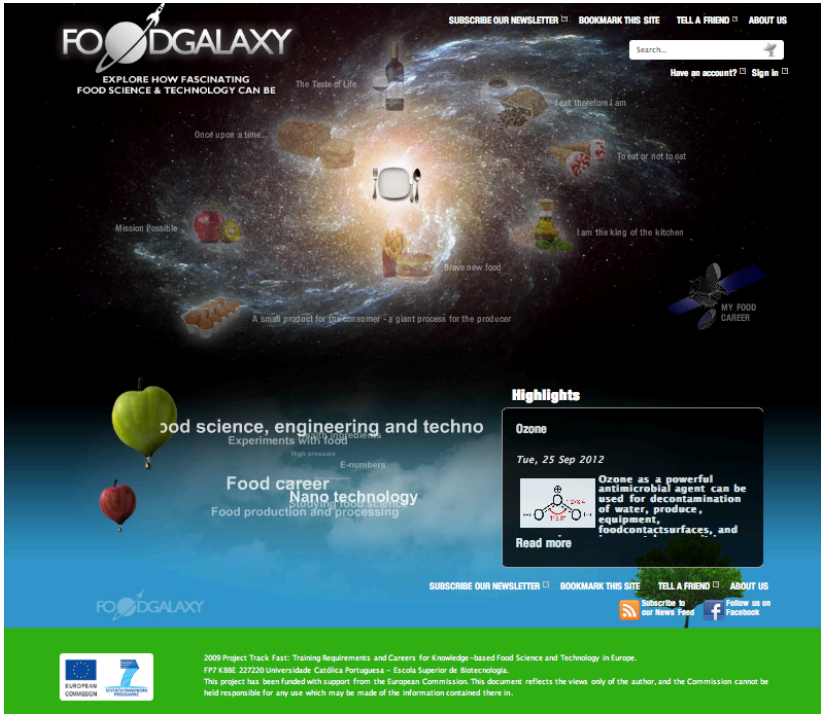
→ www.foodgalaxy.org



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→ Need to attract talents

CAREERS

WOMEN IN SCIENCE Campaign to boost women in science seeks visitors p.151

FACILITY 'Credit' swap programme aims to provide greater flexibility p.151

NATUREJOBS For the latest career listings and advice www.naturejobs.com

FOOD SCIENCE

A smorgasbord of opportunity

Food science is fun — and boasts better job prospects than many other industry niches.

BY ALLA KATSNELSON

Tara McHugh recalls the fruit bar with more than a dollop of pride. In her early days at the US Department of Agriculture (USDA), McHugh led development of the technology for making 100% fruit bars, and then helped apple and pear growers to launch a company, Gorge Delights, to manufacture them. "We wanted to get people to eat more fruit," she says. The firm, based in North Bonneville, Washington, still sells the product a decade later, and even now it occasionally checks in with manufacturing questions, says McHugh, leader of processed-foods research at the USDA's site in Albany, California. Her team has also taken on projects such as helping Newgen Foods in Stockton, California, to develop sandwich wraps made from vegetables, and working with Monterey Mushrooms in Watsonville, California, on a growing process that ups the vitamin D content of fungi.

McHugh leads about a dozen scientists who study how food processing affects nutrition, and devise food processes that boost health. "One of the things I've liked most about my job is the ability to partner and take the basic research we develop into commercialization," she says.

The science of food is a great career choice for scientists of a practical bent, says Charles Shoemaker, academic advisor for undergraduate and graduate students in the food-science department at the University of California, Davis. "We're all familiar with eating, all our lives," he says. Food science "is a way to go into a scientific career and stay anchored to something you're really comfortable with." As a profession, it has long been something of a secret, says Shoemaker, but that is starting to change — owing in no small part to the rise of celebrity chefs and television programmes about food and cooking. "It sounds kind of silly in a way, but [US television channel] the Food Network has added a really serious degree of legitimacy to food science," he says.

The field encompasses a wide range of scientific disciplines: the chemistry of how ingredients interact; the microbiology of harmful and helpful bacteria; the biology of the sensory processes that underlie smell and taste; nutritional assessment; and the engineering involved in creating measurement tools or manufacturing, to name a few. Researchers might work with processors that make a type of food tastier, healthier or cheaper; oversee quality standards or compliance with government regulations; or specialize in studying an elemental component of food, such as proteins or carbohydrates.

MIX IT UP

More than in other disciplines, says Shoemaker, food scientists must be able to collaborate, because so many steps, components and ideas go into developing a food product. "You'll take on a project, and at some point you'll have to deal with food-safety issues, chemistry to deal with the stability of a product, engineering in scaling up production," he says. "You're not necessarily going to be an expert in those areas, but you need to be able to converse with relevant people and understand their issues and how they reflect on your product."

Most people enter the job market after completing dedicated undergraduate or graduate degree programmes in food science. The curricula of such programmes often underscore the interdisciplinary approach. Wageningen University in the Netherlands, for example, runs a respected master's programme with specializations in areas such as food biotechnology, sustainable food processing and ingredient functionality. The course features on a list of 52 graduate programmes that meet the educational standards of the Institute of Food Technologists (IFT) in Chicago, Illinois, a professional group allied with food-science organizations around the world.

Most academic programmes require students to complete internships to get more substantive research experience in work environments. A placement might be at a multinational giant such as PepsiCo, based in Purchase, New York, Heinz, based in Pittsburgh, Pennsylvania, or Cadbury, based in London. Or it might be ▶

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CAREERS

▶ in a food biotechnology start-up with few staff members; a government facility such as the US Food and Drug Administration or the European Food Safety Authority; or an academic lab.

Even in academia, much food research is funded by companies or trade groups. On the plus side, that gives young researchers plenty of options for funding, and it increases fluidity between sectors, so scientists working in industry may have the opportunity to return to academia.

TOO MANY COOKS

The heavy industry involvement can also bring challenges, says Megan Clements, who is finishing a food-science PhD at the University of California, Davis, and has already taken on her first job, at Hampton Creek Foods, a start-up in San Francisco. Her dissertation looks at how to measure almond quality and is funded by the Almond Board of California, based in Modesto. "It was a marriage of convenience in some ways, but it was a good marriage nonetheless," she says. However, she cautions that the goals of some industry-proposed projects are too narrow to give students the research experience they need to satisfy their academic requirements and add value to their CVs. Industry agendas can also be fickle. "If suddenly they are not interested in what you originally started with, they might ask you to switch your topic two years in," she says, adding that graduate students should recognize that academic advisers can also have vested interests linked to industry partners that might conflict with the student's needs.

The long arm of industry brings solid job prospects — a particular perk in the struggling economy. Unlike the pharmaceutical industry, which has haemorrhaged research staff over the past few years, food-science recruiters and long-time researchers say that the sector has been touched only lightly by the economic crisis. According to the IFT, earnings for new recruits had dropped by 2009, but have been creeping back up. The organization's annual salary survey showed that in 2011, US food scientists earned a median of $87,800 (M. E. Kuhn *Food Technol.* **66**, 26–39, 2012). Entry-level salaries start at about $40,000 for jobs such as vice-president of global research and development at a multinational company, remuneration can easily reach $250,000, says Susan Catarich, senior executive recruiter at Opus International, a recruitment firm based in Deerfield Beach, Florida, that specializes in food-science positions.

> *"Nearly everyone who graduates has a job, and many are choosing from two or three."*

Tara McHugh helped to develop vegetable-based sandwich wraps.

In Europe, master's-degree holders can expect entry-level salaries of €30,000 (US$39,000) or more for positions in product development or food safety at medium-to-large companies. Researchers with a PhD in an area such as dairy or bakery science could get €45,000–50,000 for an entry-level product-development post, and double that with 5–10 years of experience, says Jan-Willem Breedveldvoren, a managing partner at recruiting firm SHR Life Sciences, based in Amsterdam. Jobs with more of a commercial bent — in which researchers must provide technical assistance to customers or keep abreast of regulatory issues, and must have higher-level expertise in a niche topic such as starches or cocoa — might pay $65,000–80,000, he says. "Nearly everyone who graduates has a job, and many are choosing from two or three," says Ralf Hartemink, director of the food-science programme at Wageningen University.

INGREDIENTS FOR SUCCESS

Product development is a common area for researchers to break into industry. Research and development at multinational companies with developed product lines may be tame, says Shoemaker, but there is plenty of innovation and entrepreneurship in the start-up world, which is particularly well-established in California. "It's what the bionic-h world was like ten years ago," he adds.

For instance, Hampton Creek hired Clements to develop a plant-based product with the right emulsion properties to replace egg in products such as mayonnaise. The company believes that taking eggs out of food preparation improves safety by lessening exposure to pathogens such as *Salmonella* and bird flu, as well as significantly reducing costs and increasing sustainability.

Other areas with good job prospects are nutrition and food safety. Consumers are increasingly demanding healthy foods that contain reduced amounts of fats, calories or sodium, or carry benefits such as probiotics to improve digestive health or fibre to reduce the risk of heart disease. The health claims of such products must be tested, and some items must be reformulated for specific ends.

A growing awareness of food safety has also created a need for researchers to monitor microbial and chemical contamination, and design safer food-development processes. US industry and government agencies are likely to add jobs to ensure compliance with the Food Safety Modernization Act, passed in 2011.

Such highly structured regulatory work is one of two types of government food-science jobs, notes Shoemaker. The other is research geared towards health and the public good. McHugh considers her post at the USDA to be a cross between an academic and industrial position. "We still publish manuscripts and are evaluated largely on our fundamental research, but we also have a unique ability — and it's part of our remit at the USDA — to transmit those technologies to customers/advisors," she says.

Although specialized academic programmes provide the easiest entry point into a food-science career, there are opportunities for researchers in almost any basic biological, agricultural or engineering field who have a love of food. Jennifer Kimmel, a protein chemist at Kraft Foods Group in Glenview, Illinois, never expected to stumble into a food industry job. But after spending five years as a postdoc studying enzyme kinetics at the University of Missouri in Columbia, she grew worried about getting funding. "I had to get a job really, really fast," she says. With her postdoc drawing to a close, she saw an advertisement for a position at Kraft that asked for experience with enzyme kinetics. She decided to apply, and got the job.

Kimmel's grounding in basic research has turned out to be a strong asset. It allows her to help product developers and other scientists to predict how proteins would work in particular products. That means understanding "not only the phenomena that are supposed to happen, but also the ones that aren't supposed to happen", she says. "No one wants a cheese that doesn't melt." ■

Alla Katsnelson is a freelance writer based in New York.

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Alla Katsnelson,
Nature, Nov 2012

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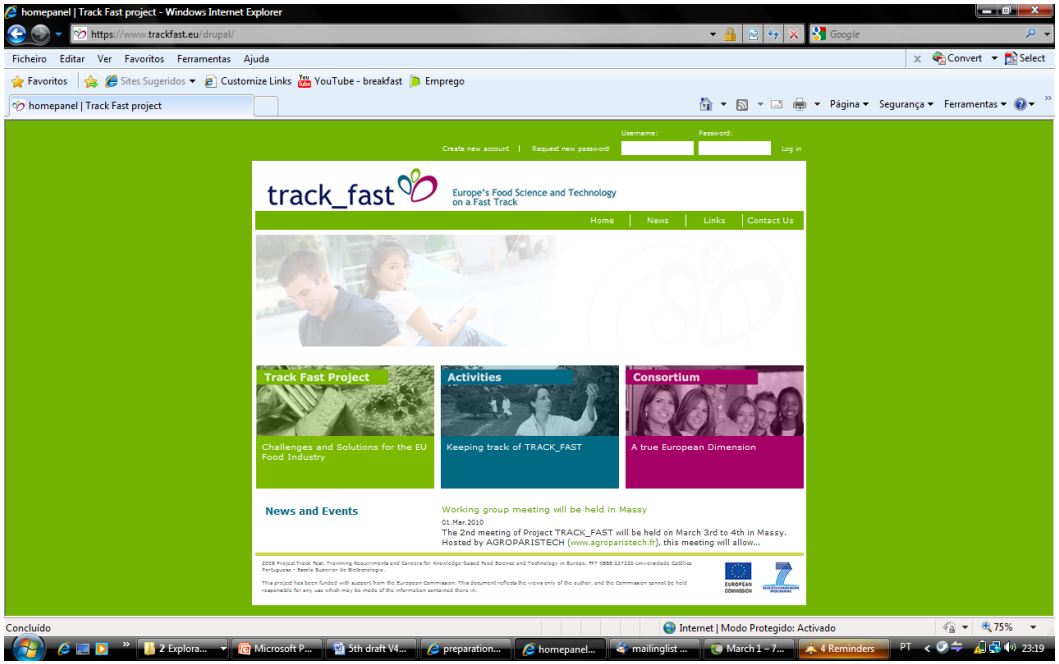

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Track_Fast Open Symposium

29th January 2013

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