



TRUEFOOD

Traditional United Europe Food

Guideline on effective knowledge and technology transfer activities to SMEs in the food sector with particular focus on traditional food manufacturers



Contract no. FOOD-CT-2006-016264

Instrument: Integrated project

Thematic priority: Food Quality and Safety (#5)

Start date of project:

1 May 2006

Duration: 48 months

Organization name of lead contractor for this deliverable: CCH-P19

Prepared by: Campden BRI Magyarország Nonprofit Kft. (in collaboration with AGRI, ENEA, NOFIMA/MATFORSK, SPES/FED, SPES/ FEVIA, SPES/FIAB and SPES/SEVT)

Date: 30.10.2009.Version final

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

This publication has been produced with the assistance of the European Union. The content of this publication is sole responsibility of the authors and can in no way be taken to reflect the views of the European Union.



TRUEFOOD
Traditional United Europe Food

**Guideline on effective knowledge and
technology transfer activities to SMEs
in the food sector with particular focus
on traditional food manufacturers**

Preface

The EU is facing a financial and economic crisis unlike any seen before and just now, at the beginning of 2010, it is striving to pull through the difficulties arising from these troubled times.

All EU Governments agendas are more and more focused on the competitiveness of manufacturing and convenience systems such as financial, retail and new welfare areas.

It is a very complex challenge and in Europe there are more difficulties than in other big competitive continental areas (the Americas, India, South East Asia). Also Africa is pressing for a piece of the worldwide worthy cake. Europe is arriving at this occasion very tired; demographic and economic dynamics is very modest. Research and innovation rates are now very low. The bureaucracy and the high taxes discourage the entrepreneurial initiatives. The public and private levels of education seem to be insufficient and also the levels of flexibility of the EU systems seem to become less as time goes on. All this makes Europe less adaptable to change: first of all those changes that depend on new environmental policies and on new social care and employment policies.

But behind its history Europe has an incredible patrimony that no other continental system has: great cultural differences and diffusion of SMEs both in the secondary and third sector; both patrimonies, and cultural and entrepreneurial, exist especially in the food chain that has regional and local gastronomic roots and not less than 300.000 companies in 27 Member States, of which about 35.000 have an industrial connotation. Therefore European competitiveness will depend on SMEs, and in particular on dynamic and regional roots food companies.

Even today this first manufacturing industry of the EU guarantees daily meals for almost 400.000.000 people and it guarantees them with total safety, quality and taste; not only does food industry respect and follow the European consumers needs. Not only does it spread though its gastronomic cultures unique and appreciated lifestyles all over the world. Not only does it give work directly to more than 4 million people but indirectly to other 8 million people. And it is here that one of the most important challenges for the future of the socio - economic competitiveness of the EU countries is played. And the industrial policies cannot take into account this impressive dimension of the EU food and drink industry.

Among the policies addressed to re-launch the competitiveness there is the Integrated Project Truefood that was approved within the FP6 of the EU DG Research. This project recommends the transfer of new knowledge and new technologies to food SMEs in respect of thousands of local gastronomic traditions so that they may be able to maintain a competitive advantage and a major added value in the world by introducing incremental innovations in products and manufacturing processes.

However SMEs have their own languages, local and regional markets and direct relationships with retail and consumers.

Therefore every new techno - scientific knowledge must be declined to be transferred to SMEs in order to be received in products and processes, in entrepreneurial languages, in a serious analysis of the needs and of the market, in a serious cost - opportunity evaluation, so that the relationships between knowledge producers (researchers, government agencies, academia, professionals, technicians) and concrete applications on an industrial scale are valid, efficient relationships which respect industrial realities and consumers. These are the real beneficiaries of the new knowledge and technology.

This booklet, magnificently put together by Professor András Sebők, is a rare example of tool useful to techno - scientific mediators who will have to facilitate more and more the collaboration between techno - scientific and manufacturing agents.

This booklet identifies in a very simple and direct manner the evaluation steps, the entrepreneurs' requirements, the barriers and the opportunities for the collaboration, the skills necessary to introduce innovation.

Thanks also to this initiative the pathway to a wealthier and more competitive Europe, with a particular focus on the food and drink industry, may be ensured if it is put into practice by all the mediators.

The booklet will be translated in the all the main languages of the EU and will distributed by the networks that we already put into place among research centres, Technology Platforms and government agencies, also thanks to the decisive contribution of the EU DG Research.

Good work to all!

Dr Daniele Rossi

Director General of Federalimentare
Co-ordinator of the Truefood Project
The Chairman of CIAA Research Science Expert Group
The Vice - Chairman of the ETP "Food for Life"

Guideline on effective knowledge and technology transfer activities to SMEs in the food sector with particular focus on traditional food manufacturers

Version final (30.10. 2009)

Working Group Members:

- András Sebők, (Chairman and editor), Campden BRI Magyarország Nonprofit Kft., (Hungary)
- Nuria Maria Arribas Vera, Federación Española de la Alimentación y Bebidas (FIAB) (Spain)
- Antonietta Branni, Federalimentare - Federazione Italiana dell'industria Alimentare (Italy)
- Cecilia Chiapero, Agriconsulting SpA (Italy)
- Lorenza Daroda, ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development (Italy)
- Gunhild Drabløs, Nofima - Norwegian Institute for Aquaculture, Fisheries and Food Research (NORWAY)
- Anne-Christine Gouder de Beauregard, Fédération de l'Industrie Alimentaire (FEVIA) (Belgium)
- Federico Morais, Federación Española de la Alimentación y Bebidas (FIAB) (Spain)
- Fotini Salta, Federation of Hellenic Food Industries (SEVT) (Greece)
- Federica Scotto di Tella, Federalimentare - Federazione Italiana dell'industria Alimentare (Italy)
- Katelijne Strubbe, Flanders'FOOD (Belgium)

Reviewed by:

- Marina Leonardi, Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) (Italy)

Acknowledgements

We would like to express thanks to the following people for their time and effort in the commenting on the various chapters of the guideline, and who contributed with their practical knowledge and technical expertise.

We are grateful also to the organisations listed below who provided case studies and examples, and who allowed to their staff to participate and generally supported our work.

TRUEFOOD - "Traditional United Europe Food" is an Integrated Project financed by the European Commission under the 6th Framework Programme for RTD. Contract n. FOOD-CT-2006-016264

Project coordinator:

- Daniele Rossi, Federalimentare - Federazione Italiana dell'industria Alimentare (Italy)

Comments were received from:

- Alessandro Cordelli, Federalimentare - Federazione Italiana dell'industria Alimentare (Italy)
- Julian Drausinger,- Fachverband Lebensmittelindustrie/Lebensmittelversuchsanstalt (FIAA/LVA) (Austria)
- Françoise Gorga, Association Nationale des Industries Alimentaires (ANIA) (France)
- Tim Hogg, Escola Superior de Biotecnologia, Universidade Católica Portuguesa (Portugal)
- Miroslav Koberna, Federation of the Food and Drink Industries (FFDI) (Czech Republic)
- Jan Pivonka, Federation of the Food and Drink Industries (FFDI) (Czech Republic)
- István Pauer, Federation of Hungarian Food Industries (FHFI) (Hungary)
- Pedro Queiroz, Federação das Indústrias Portuguesas Agro-Alimentares (FIPA) (Portugal)
- Šárka Šteinarová, Federation of the Food and Drink Industries (FFDI) (Czech Republic)

Organisations:

- Association Nationale des Industries Alimentaires (ANIA) (France)
- Agriconsulting SpA (Italy)
- Campden BRI (United Kingdom)
- Campden BRI Magyarország Nonprofit Kft. (Hungary)
- Epleblomsten AS (Norway)
- Escola Superior de Biotecnologia, Universidade Católica Portuguesa (Portugal)
- Fachverband Lebensmittelindustrie (FIAA) (Austria)
- Federación Española de la Alimentación y Bebidas (FIAB) (Spain)
- Federação das Indústrias Portuguesas Agro-Alimentares (FIPA) (Portugal)
- Federalimentare - Federazione Italiana dell'industria Alimentare (Italy)
- Federation of Hellenic Food Industries (SEVT) (Greece)
- Federation of Hungarian Food Industries (FHFI) (Hungary)
- Federation of the Food and Drink Industries (FEVIA) (Belgium)

- Federation of the Food and Drink Industries (FFDI) (Czech Republic)
- Flanders' FOOD (Flanders, Belgium)
- Fresh Concept (Belgium)
- Innovatech (Belgium)
- Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) (Italy)
- La Morella Nuts S.A. (Spain)
- Lebensmittelversuchsanstalt (LVA) (Austria)
- Nofima - Norwegian Institute for Aquaculture, Fisheries and Food Research (Norway)
- Undredal Stølsysteri (Norway)
- National Technology Platform WagrALIM (Wallonia, Belgium)

Table of contents

	Page No.
1. Introduction	1
2. Knowledge transfer in the process of innovation	8
3. Identifying needs and exploring hidden needs of the industry	16
3.1 Preparations	16
3.2 Identifying R&D needs of the company	19
3.3 Exploring hidden needs of the company	23
4. Dialogue between the industry and research	24
4.1 General needs of collecting and structuring available information, research results and converting it to industry friendly format	24
4.2 Databases on research results, overviews and research summaries	25
4.3 Structuring information for technical reviews, manuals, good practice guidelines, expert systems	25
4.4 Role of the mediators	26
4.5 Dialogue with the research centres, universities and other research providers	29
4.6 Presenting a solution to the industry	30
5. How to implement research-based knowledge at SMEs	33
5.1 Underlying assumptions	33
5.2 Developing solutions, identifying additional research needs	35
5.3 Matching industry needs and available solutions	38
5.4 Implementation of collaborative R&D projects	39
6. Knowledge and technology transfer tools - how to handle different levels of competence within the companies	41
6.1 General considerations	41
6.2 Awareness raising through seminars	43
6.3 Capacity building through training	44
6.4 Guided experimentation during the research process	46
6.5 Annual thematic seminar/conference during the research process	47
6.6 Presentations on industry meetings	47
6.7 Personal visits	48

6.8	Participation in expert panels	48
6.9	Using the internet/project home page	48
6.10	Training course at the end of research project	49
6.11	Outreach activities towards the SMEs	49
6.12	Collective techniques - using networks	50
6.13	Product development network - Nofima model	53
6.14	National Technology Platforms	54
6.15	Brokerage events	54
6.16	Best practice guides	54
6.17	One page summaries of the practical results of the research projects	56
6.18	Newsletters	56
6.19	WEB-based self assessment tools	56
6.20	Transfer of people between research and industry	57
6.21	Posters	57
6.22	Booklets	57
6.23	CD-ROMs	57
6.24	Annual reports	59
6.25	Trade press articles	59
6.26	Scientific publications	59
7.	Managing the knowledge and technology transfer process	60
7.1	General considerations on partnership in research collaborations and knowledge transfer	60
7.2	Management practices for SMEs	61
7.3	Complementary support services for SMEs	62
7.4	Management practices for research and knowledge transfer organisations	65
7.5	Recommended practices for contractual arrangements for research and knowledge transfer between research providers and SMEs	68
7.6	Protection of intellectual properties	70
8.	Success stories	72
8.1	The involvement model	72
8.2	Epleblomsten - The Apple Blossom	74
8.3	Industry shared collective and contract research at Campden BRI	75
8.4	Collective learning in working parties	78
8.5	Project database at FIAB	78
8.6	Actions of technology transfer undertaken by the Training and Dissemination Units - TDUs of the TRUEFOOD project	78

8.7	Actions of technology transfer from the Walloon NFTP Platform WagrALIM (Belgium)	82
8.8	Fresh Concept: a biodegradable packaging for meat products	83
8.9	Actions of technology transfer from the Flemish NFTP Platform 'Flanders' FOOD' (Belgium)	84
8.10	Food Technology Network in Austria	85
8.11	LA MORELLA NUTS, S.A. HISTORY AND PROFILE	85
8.12	Goat cheese from Undredal	86
9.	References	89
10.	Glossary	91
11.	List of abbreviations	98
Annexes		
Annex 1:	Template of questionnaire to collect SMEs needs in innovation / training activities	99
Annex 2:	Role of mediators in improving the knowledge transfer	100
Annex 3:	Science and Technology Watch (STW) Newsletter of Flanders' FOOD (Belgium)	102
Annex 4:	Structure of the INFO-SHEET of the TRUEFOOD project	103
Annex 5:	Example of the Italian Truefood webpage (Federalimentare) dedicated to the newsletter	104
Annex 6:	Example of the Federalimentare newsletter	105
Annex 7:	Template for a training assessment	106
Annex 8:	Example of an INFO-SHEET	109
Annex 9:	Example of the French INFO-SHEET	110

I. Introduction

This document was prepared within the TRUEFOOD project (Traditional United Europe Food) "Improving quality and fostering innovation of European traditional food production systems", an integrated project financed by the EC under the FP6 - contract no: FOOD-CT-2006-016264. The aim of this document is to provide guidance on practical skills and successful working practices in contacts and daily work relationships with the food businesses to all personnel involved in the process of knowledge and technology transfer to food businesses including mediators between industry and the research community, knowledge transfer staff of research organisations and universities and also those researchers, who want to foster the implementation of their research results in food businesses. Since small and medium size enterprises (SMEs) have several additional barriers of knowledge transfer compared to large companies, in this document specific attention is paid to the aspects of the SMEs.

With traditional food products a sound balance has to be achieved between the requirements of maintaining the genuine, traditional character of the product and the implementation of the new developments in the knowledge and technology. The application of such new knowledge and technology should be considered, which can provide additional benefits for the society and the company, without compromising the original nutritional, health and cultural values of the products. Therefore the effective knowledge and technology transfer has a specific importance in the innovation at traditional food products

Investment in research has to bring benefits for society through increased knowledge, new products and services having better attributes, new jobs and contribution to the competitiveness of the companies. In Europe efforts in public research have been focused mostly on creating new knowledge and disseminating it through scientific publications; less attention has been paid to the conversion of the scientific results into solutions, which can be used by industry. Mainly the public benefits of increasing knowledge through scientific excellence have been emphasized, particularly with publicly funded research projects. In the USA and some other leading economies outside Europe the commercialisation aspects of research results are taken as equally important as dissemination for the scientific community. For effective exploitation of the new knowledge in the public sector it is necessary to identify and protect those elements of the results which can form an intellectual property, that can be protected. Industrial users usually expect confidentiality and at least a certain level of exclusivity of the specific knowledge, in which they invest money, efforts and other resources, which ensures them competitive advantage. It has been recognised that one of main constraints of the competitiveness of the European economy is the weakness of the transfer of knowledge from researchers to the private sector for exploitation.

The European Commission has designated knowledge transfer as a key factor of the European innovation strategy for enhancing competitiveness and has initiated several actions. A Commission communication (European Commission 2007d) was published on knowledge transfer between research institutes and industry. Several guidelines were prepared on improving the effectiveness of knowledge transfer. However, these guidelines focused mainly on policies and procedures, that research organisations have to apply internally to improve their own systems for knowledge transfer; to protect IPR, to handle contracts, etc. Limited information was published about the practical experiences, skills, and successful working practices, that personnel dealing with the daily execution of knowledge transfer can use as guidance in their work.

Several research results and practical experiences show that one of the main barriers in effective knowledge transfer is the difference in the way of thinking and priorities of industry and researchers. There are significant differences also between the approach and the opportunities of large companies and SMEs. While researchers usually focus on scientific excellence expressed in validated statements and methods, based on substantial proofs and think over a longer time period, SMEs need a solution for a problem, which can be implemented easily - in many cases with limited resources - and quickly.

While in scientific statements the level of uncertainty has to be minimised, in the decisions in industry a level of uncertainty is nearly always present, which is acceptable if it is clearly indicated and the related risks are manageable. There is a significant difference in the style of scientific communications and style and way in which information is communicated within industry. Therefore scientific statements and descriptions have to be converted to solutions, described in the language of the industry, before they can be absorbed and applied by industry personnel. This conversion requires specific skills and usually designated people like professional knowledge transfer mediators.

These cultural differences cause, in many cases, misunderstandings, communication problems and stress, which lead to lack of trust between the partners. Since food products are eaten, and are thus incorporated into the human body, the consumer's perception of changes differs significantly from those products, which are used without having a direct influence on the functioning of the body. When radical changes are made in the nature, structure or properties of food, food safety concerns are raised or the products are rejected simply because their sensory properties are different from those sensory attributes to which the consumers had been used and for which their preference has evolved through long experience.

Therefore in the food sector incremental innovation is more typical than radical change. Consumers prefer the diversity and variety of foods. It is relatively easy to copy a successful innovative product by a competitor without investing major efforts into the innovation. A slight modification of the composition can result in a product which has somewhat different sensory

properties, and therefore it can be claimed as being different from the original product which was copied. Thus in many cases it is relatively difficult to identify such distinguishable properties or functions of a food product, which can form such an intellectual property that can be protected and enforced.

Therefore senior managers of many SMEs, particularly in the new member states, do not trust in the feasibility of investing efforts and financial resources into application of research results for innovation.

To improve knowledge transfer in the food sector, more efforts have to be made on making the decision makers of SMEs aware of the availability of the new knowledge and convince them of the feasibility of investing in research based innovation.

Therefore establishing trust between the partners has a primary importance, which can be improved if long term collaborations are built up through understanding and considering each-other's needs, expectations, way of thinking and priorities.

Other typical barriers to knowledge transfer in food SMEs include lack of skills of the SMEs in working with researchers, lack of information on consumers' needs and market, and on accessible financial support schemes, limited business, management and marketing skills, and lack of management time and resources.

This guide is intended to provide an overview of the main issues that knowledge transfer personnel have to consider and handle, but not to repeat the detailed information described in other guidelines and documents. Therefore, where detailed information is available elsewhere - like protection of intellectual properties, contractual arrangements, knowledge transfer policies of research organisations, innovation management - only short summaries are provided with references to the original sources.

TRUEFOOD - Traditional United Europe Food Putting values on traditional food products

Overall objective of the project

The overall objective of the TRUEFOOD Integrated Project is to bring innovations to the traditional food industry. This sector includes not only protected and patented foods, but also other traditional regional and national specialties. The innovations will improve the competitiveness in the sector through higher food quality and safety standards as demanded by consumers, but will ensure that the essential characteristics of these culturally important foods are not sacrificed. The project will bring research and industry closer and facilitate effective collaboration and technology transfer.

Providing appropriate innovation

TRUEFOOD is aimed at bridging a clear gap between the industrial sector and research and development organizations carrying out independent research that is only partially exploited by industry. TRUEFOOD has created new, efficient communication channels within the food sector at national and European levels to ensure that these research results are used appropriately by industry. This has been achieved by setting up and maintaining links between science and industry through the work of Techno-Scientific Mediators.

Improving safety and quality, preserving tradition

At the scientific level, the objective of TRUEFOOD is to develop innovations that will improve the safety and quality of food made in 'traditional' production systems, in line with consumer expectations. This is focused on the development of methods for integrating targeted modern technologies and methodologies into traditional food production and processing and all along the supply chain, including distribution, marketing and retailing.

Specific objectives include identifying consumer perceptions, expectations and attitudes quantitatively with respect to safety and quality characteristics of traditional foods, and identifying the innovations that could be introduced into the traditional food industry. These innovations cover areas such as food safety guarantees, especially with respect to microbiological and chemical hazards, and improvements in nutritional quality, whilst maintaining or further improving other quality characteristics (for example, sensory, environmental, ethical) that are recognized by the consumers of the traditional food products. The project also supports the marketing and supply chain development of traditional food products.

The project puts in place a structure of continuous training and dissemination through the SPES Food & Drink Industry National Federations, and forms a team of Techno-Scientific Mediators (TSMs), whose role is to disseminate the project findings throughout the socio-economic layers of the European food and drink industry, targeting particularly the small and medium-sized enterprises involved in the production of traditional foods. The knowledge transfer to the food and drink industry is implemented through different activities, mainly through training, dissemination and communication events.

Sustaining our traditional foods

By targeting innovation towards the wide range of traditional products that constitutes a significant proportion of the food consumed in Europe, the project aims to sustain a sizeable section of the traditional food industry in Europe and to provide assistance to food businesses so that they can deliver products that their consumers expect.

This approach will both preserve and expand consumer demand and production of traditional foods in Europe and help traditional food manufacturers to achieve conformance to EU and national trading, food safety and quality regulations as well as trader/retailer specifications. TRUEFOOD is coordinated by the Spread European Safety European Economic Interest Grouping (SPES EEIG) - a grouping of eleven national federations of the European food and drink industry helping to promote and carry out research in the food sector at the European level.

Project essentials

Full project name: Traditional United Europe Food	Project start date: 01/05/2006
Project acronym: TRUEFOOD	Duration: 48 months
Project type: Integrated project	Total budget: € 20 080 000
Theme: FP6 Food Quality and Safety	EC contribution: € 15 500 000
Contract no.: FOOD-CT-2006-016264	Project website: http://.truefood.eu

Project coordinator: The overall coordinator is Spread European Safety - SPES GEIE (Italy). The Group associates 11 European Food & Drink National Federations representing 280 branches and 35.000 European small to medium size enterprises:

- ANIA - Association Nationale des Industries Alimentaires (France)
- Federalimentare - Federazione Italiana dell'Industria Alimentare (Italy)
- FEVIA - Fédération de l'Industrie Alimentaire (Belgium)
- FFDI - Federation of the Food and Drink Industries (Czech Republic)

- FHFI - Federation of Hungarian Food Industries (Hungary)
- FI - Foedevareindustrien (Denmark)
- FIAA/LVA - Fachverband Lebensmittelindustrie/Lebensmittelversuchsanstalt (Austria)
- FIAB - Federación Española de la Alimentación y Bebidas (Spain)
- FIPA - Federação das Indústrias Portuguesas Agro-Alimentares (Portugal)
- SETBIR - Union of Dairy, Meat, Food Industrialists and Manufacturers (Turkey)
- SEVT - Federation of Hellenic Food Industries (Greece)

Project partners: Project partners are "centres of excellence" in food related R&D, with strong technology transfer units or cooperating with the traditional food sector:

- Agriconsulting S.p.A. (Italy)
- Agricultural University of Athens (Greece)
- Agricultural Institute of Slovenia (Slovenia)
- Association de Coordination Technique pour l'Industrie Alimentaire (France)
- Campden BRI Magyarország Nonprofit Kft. (Hungary)
- Centre National Interprofessionnel de l'Economie Laitière (France)
- Confédération des Industries Agro-Alimentaires de l'UE (Belgium)
- Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (Italy)
- Food Industrial Research and Technological Development Company SA (Greece)
- Genus plc. - Pic (Great Britain)
- Ghent University (Belgium)
- Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione (Italy)
- Istituto Superiore di Sanità (Italy)
- Institut de Recerca i Tecnologia Agroalimentàries (Spain)
- Institute National de la Recherche Agronomique (France)
- Institute of Chemical Technology Prague (Czech Republic)
- Laboratoire Interprofessionnel D'Aquitaine (France)
- Karadeniz Technical University (Turkey)
- Nofima, Norwegian Food Research Institute (Norway)
- National Agricultural Research Foundation (Greece)
- Norwegian University of Life Sciences (Norway)
- Progetto Europa Group S.r.l. (Italy)
- Slovak Agricultural Research Centre (Slovakia)
- Technische Universität München (Germany)

- Technological Educational Institution of Ionian Islands (Greece)
- Università degli Studi di Perugia (Italy)
- Universidade Católica Portuguesa Escola Superior de Biotecnologia (Portugal)
- University of Applied Sciences of Weihenstephan (Germany)
- Università degli Studi di Milano (Italy)
- University of Ljubljana (Slovenia)
- Warsaw Agricultural University, Faculty of Human Nutrition and Consumer Sciences (Poland)

For more information

Dr. Daniele Rossi, Project Coordinator, Spread European Safety SPES GEIE

Viale Pasteur 10, 00144 Rome, Italy

Email: direzione@federalimentare.it / info@truefood.eu

2. Knowledge transfer in the process of innovation

Summary

- Knowledge transfer involves the process of capturing, collecting and sharing knowledge, skills and competence. It includes both commercial and non-commercial activities;
- Knowledge transfer can be defined as a multi step process that can facilitate the transfer of
 - information;
 - technological methodologies;
 - results;
 - products;
 - practical toolsfrom research providers to food industry/SMEs.
- One bottleneck can compromise the efficiency of the whole process. Therefore the efforts for improving its efficiency should be focused on all major weaknesses of the process in parallel and not on isolated steps only.
- For successful implementation of the transferred knowledge there is a need for regular interactions between the knowledge providers and the company that uses the knowledge to adapt the general solution to the specific requirements and facilities of the user. The new knowledge has to be integrated into the existing knowledge base, technology and systems of the user.
- In order to obtain innovation, the process of knowledge transfer should provide the way to
 - adapt and convert applicable research results/ industrial systems;
 - connect people from research and industry;
 - upgrade competence of the personnel involved in the process;
 - strengthen networking.
- Large companies can manage the whole process of innovation, SMEs need support.
- SMEs are not uniform in innovation behaviour. Different segments need different types of knowledge transfer methods for enhancing their innovation activities

- 2.1 Knowledge transfer consists of the range of activities which aim to capture, collect and transmit knowledge (either explicit, such as in patents or tacit such as know-how), skills and competence from those who generate them to those who will transform them into economic outcomes. It includes both commercial and non-commercial activities such as research collaborations, consultancy, licensing, spin-off creation, researcher mobility and publication (European Commission 2007b). While the emphasis is on scientific and technological knowledge, other forms such as technology-enabled business processes are also included.
- 2.2 Technology transfer is the process of developing practical applications for scientific research. It is a term used to describe a formal transfer of rights to use and commercialise new discoveries and innovations resulting from scientific research to another party (European Commission 2008a).
- 2.3 Knowledge transfer is a wider concept than "technology transfer": it includes other transfer channels, such as mobility of staff, publications.
- 2.4 In other words knowledge transfer is the process of sharing of skills, knowledge, expertise, technology, know-how, practical tools, methods of manufacturing, samples of manufacturing and facilities among companies, research organisations, governments and other institutions to ensure that scientific and technological developments are accessible to a wider range of users, who can then further develop and exploit the technology in new products, processes, services systems, and organisational solutions. It includes also the transfer of technology from one industrial sector to another.
- 2.5 The process of technology transfer typically includes (AUTM 2006):
 - identifying new technologies;
 - protecting technologies through patents and copyrights;
 - forming development and commercialization strategies such as marketing and licensing to existing private sector companies or creating new start-up companies based on the technology.
- 2.6 Objectives of knowledge transfer include the enhancement of social and/or economic well being. The public benefits are derived from products and services that reach the market and jobs that result from the development and sale of products and services. The transfer of research and development results from the research organisations and institutions to the commercial market place is called commercial deployment ("commercialisation") (Teagasc 2008).

2.7 Research-providing organisations, universities and other institutions may have commercial and non-commercial reasons for carrying out knowledge transfer activities (European Commission 2007/b), (AUTM 2006):

- attraction of funding for research from industry;
- generating income to support further research and development and education activities through providing access for the private sector to the new knowledge and technology generated by the research via contracts, licences, patents or creating new spin-off companies;
- development of mutual trust between the research-providing organisation and industry;
- enhancing the skills and competence of the organisation with practical industrial and business experience;
- increasing the reputation and prestige of the organisation in the private sector for successful support of industry and for successful projects attracting new clients;
- increased recognition of the organisation and its achievements and discoveries by the public authorities and funding bodies for serving the benefit of the economy and society;
- attracting and retention of talented staff and/or students;
- local economic development;
- in some countries (like in the USA) for compliance with federal regulations.

Each research organisation and institution has specific priorities within these areas.

2.8 The organisation which carries out knowledge and technology transfer should have a clear view about its own objectives and priorities for carrying out this activity. It shall be ensured that the staff responsible for the design and implementation of the knowledge and technology transfer activities shall understand and implement these objectives and priorities.

2.9 A holistic approach of innovation is described by the following innovation favouring components (A.T. Kearney 2006) within a company, which they have to manage systematically and in an on-going fashion:

- an innovation strategy that is aligned with the business strategy of the company;
- an organisation that drives innovation by its structure and culture;

- a product-life-cycle process that continually develops the capabilities for idea generation, product development, market launch and timely discontinuation of products and services that are not longer profitable;
- innovation enablers such as knowledge management, IT and human resource systems, project and program management.

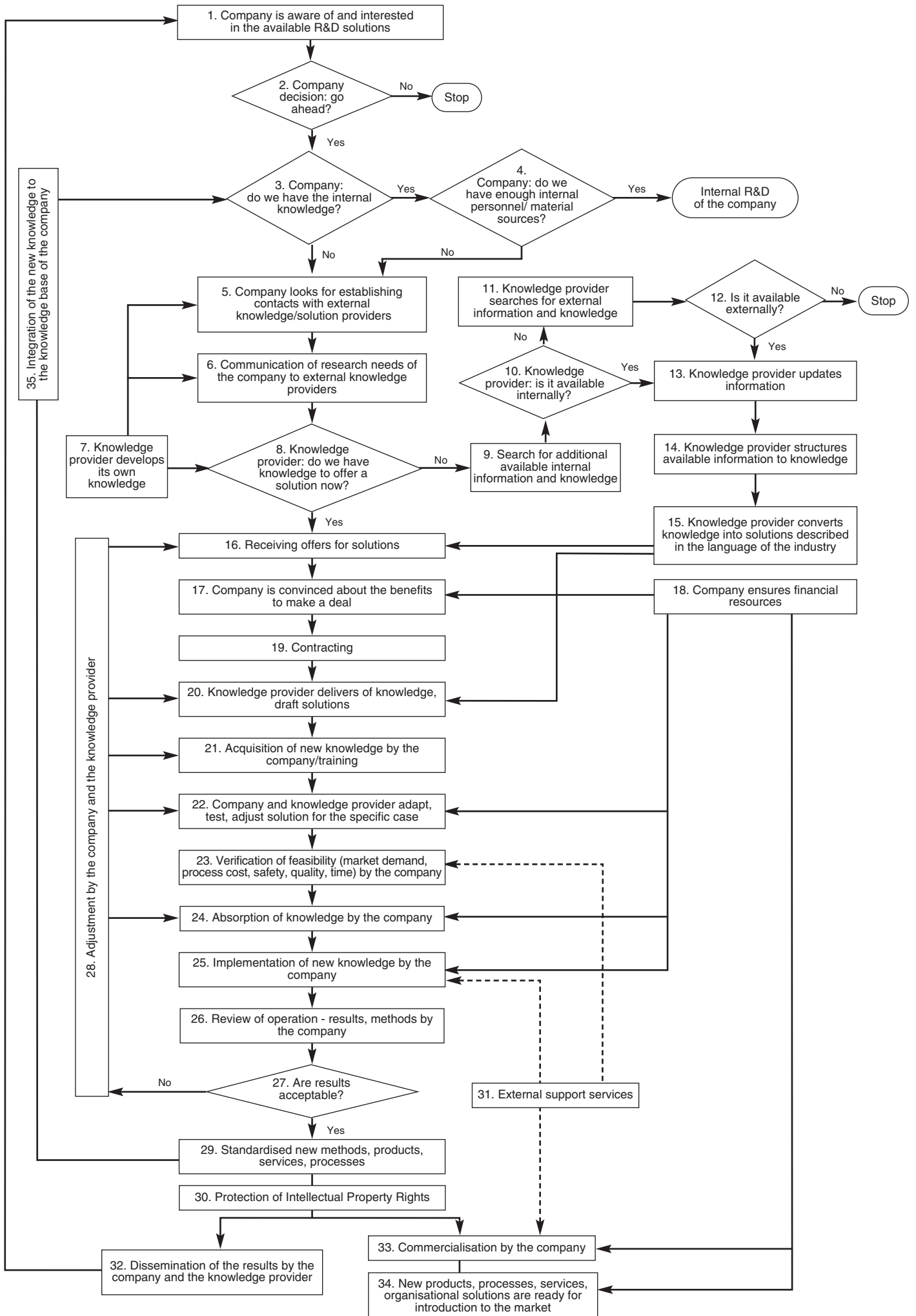
2.10 There are six major phases within the process of knowledge transfer from the viewpoint of the knowledge transfer organisation:

- identifying the knowledge holders;
- motivating them to share knowledge;
- designing a sharing toolkit (containing a communication tool for the knowledge providers, an evaluation tool for the users and a follow up tool for both the knowledge providers and the users) to facilitate the knowledge transfer;
- executing the transfer plan;
- measuring effectiveness of the transfer;
- applying the transferred knowledge.

These are implemented through several steps.

2.11 The flowchart of the knowledge transfer in SMEs is described in Figure 1.

Figure 1: Flowchart of the knowledge transfer process for SMEs
(modified from Sebök, 2007)



2.12 The main phases of the knowledge transfer process from the point of view of a company are:

- identification and definition of the problem to be solved or the opportunity to be exploited by innovation, and definition of the innovation needs;
- generation of new ideas and/or gathering new knowledge from external sources;
- checking the feasibility of the project;
- building in the new knowledge and the necessary resources in new products, processes, services, systems, market solutions;
- diffusion of the new knowledge and skills within the company;
- implementation of the new knowledge;
- preparation of the market introduction of the new products, services;
- integration of the new knowledge into the existing knowledge base of the company and combining it with adequate resources to form a new competence and dissemination of those part of the results which can be made publicly available.

Since Innovation and also knowledge and technology transfer are multi-step processes, one bottleneck at one step can compromise the efficiency of the entire process. Therefore for improving effectiveness, the process as a whole has to be considered and the weaknesses and barriers to implementation of innovation in food SMEs and their causes have to be analysed systematically at each step of the process in order to develop measures for their elimination or reduction.

2.13 For successful exploitation of the results of the research for innovation, knowledge transfer shall ensure ways to:

- convert research results into an applicable format in the industry and adapt them to the specific problem;
- integrate the new knowledge into the industrial process;
- connect people from research and industry;
- upgrade competence of the personnel involved in the process;
- ensure that the critical mass of resources is devoted to R&D and innovation which is necessary to achieve successful entrance to the market.

2.14 Large companies can manage the whole process, SMEs need support. This support will include methods and systems for collective use of their limited resource.

- 2.15 Research and Development (R&D) is a collaborative process between the in-house R&D activities and external research cooperation. For successful accomplishment of an innovation project an ongoing interaction is necessary between the personnel providing the knowledge base of the firm (including in-house staff and external RTD providers) and the personnel knowing the capabilities of firm and the market opportunities. Activities such as regular exchange of views and adjustment of the research and technology development (RTD) solutions to the specific needs and conditions of the businesses are necessary during the whole process. The risk of failure of the innovation project can be reduced by regular feedback from market testing and from other disciplines like marketing, production, engineering, finance, quality assurance, purchasing, etc., which are involved into the process of development.
- 2.16 Making industry aware of the research results is only a small part of the typical barriers of knowledge transfer. Segregated actions of researchers for publication of the results which are focused to a short period, to a few occasions, on one phase of the process have limited chance for success.
- 2.17 For increasing the innovation activities of SMEs and their effectiveness it is not enough to focus knowledge and technology transfer activities solely on the technical and organisational elements related to idea management, product/process development and building a continuous improvement process. There is a need for parallel business supporting assistance for SMEs to develop their business strategy incorporating the targeted innovation and also for marketing, managing the use of knowledge, managing human and technical resources, project and programme management, and for exploiting the opportunities in information and communication technology (ICT) systems.
- 2.18 SMEs can be segmented by their innovation behaviour: Different groups show clear differences in acceptance of new ideas, or solutions from external sources such as RTD providers (EURAB, 2004), Thomas, B. 2000). Different segments of SMEs have different needs. Segmentation includes
- the Innovators (Technology Pioneers, representing 2.5-3% of the SME population with a high level of research activities) (see 2.19);
 - the Early Adopters (Leading Technology Users*, 10.0-13.5%) (see 2.19);
 - the Early Majority (Technology Adopting Enterprises, ca. 20-35%) (see 2.20);
 - the Late Majority and Laggards (Basic SMEs, around 50-70% of the population).(see 2.20)

- 2.19 Only the Innovators and the Early Adopters, who use new technologies at an early stage, and then develop the respective techniques with their own research capacities, are open to exploring new ideas from external sources on their own. They represent only a small fraction of all adopters.
- 2.20 The majority of the SMEs prefer to reduce the risks of exploration of a new idea from external sources by following those ideas and trends which have already been explored by other companies, and they prefer to learn from each other (Thomas, B. 2004). In this group there are several typical segments: the Early Majority, which are low innovative SMEs adapting existing technologies, and Late Majority and Laggards, which have very limited or no R&D activities.
- 2.21 Therefore, the usual communication from RTD providers on new research results may only interest the Innovators and Early Adopters. For the majority of SMEs networking or collective knowledge transfer methods linked to a collective research approach provide a more appropriate way for transferring knowledge, particularly in the phase of idea generation, and preparatory and experimental trial phases of an innovation project.
- 2.22 Technology Adopting Enterprises need support for their involvement in knowledge transfer actions, participation in collective research measures, and involvement in pilot projects (EURAB, 2004). Basic SMEs can benefit from measures to stimulate innovation, e.g. information, education and training on innovation management, improved knowledge transfer and coaching in the innovation process. Leading Technology Users can benefit from participation in simple, bottom up international R&D collaboration schemes, like EUREKA and the "Research for SMEs/SME associations" schemes, support in seeking and using intellectual property rights, and support for direct collaboration with external RTD providers and for market oriented R&D projects. Technology Pioneers need support for participation in large international projects, support for risk capital, and mobility awards for recruiting and training R&D staff.

3. Identifying needs and exploring hidden needs of industry

Summary

- Careful preparation by knowledge transfer personnel is essential before discussions with companies, particularly with SMEs on their research needs. The preparation should typically cover collecting information on the activity of the company, establishing good overview of the typical problems and avoidable R&D results and practical solutions in the potential area of interest of the company and on the current typical challenges for the industry sector.
- The interest of the representative of the company has to be raised at an early phase of the discussion. The message to support this should be explained in a clear, concise, easily understandable way, focusing on the benefits to the company of using the knowledge-based solutions offered. Details can follow once the interest has already been established.
- For exploring the needs of the company, dialogue should be encouraged. Careful listening is recommended to the explanations of the company representative about their problems, needs, ideas.
- For exploring hidden needs of SMEs they first have to be made aware on the available solutions. Presentation of successful examples can be motivating for SMEs.

3.1 Preparations

- 3.1.1 Visits on site and interviews are the main ways to collect SME's needs. It is important to select the most motivated companies and/or the most motivated employees. One-to-one meetings provide the best chances to set up a dialogue and collect SME's needs (TRUEFOOD project, 2008).
- 3.1.2 Questionnaire surveys and focus group discussions can also be used for identifying the typical needs of the food industry and the main trends in their changes. However because of the confidential nature of the innovation activities these methods provide mainly general information. This information can be used for establishing the research priorities and definition of research problems. For identification of the specific needs of a company for knowledge transfer personnel discussions are usually unavoidable.

- 3.1.3 Personal and/or organisational relationships can be a significant help in organising meetings with industrial partners. Trust in the interviewer and his/her organisation based on previous experiences can contribute to getting an appointment with the management of the company.
- 3.1.4 Before personal meetings careful preparations should be made to get a good general overview and understanding of the market situation, and the main trends of and challenges for the branch of the food industry in which the business is operating. The necessary information can be collected through attending industry meetings, and reading trade press, brochures, annual reports, public documents and surveys on the internet. Valuable information can be collected from the documents of the European and National Technology Platforms such as Vision Documents, Strategic Research Agenda and Implementation Action Plans on the main research challenges, the proposed research activities and expected outcomes. These documents reflect the balanced and agreed view of the different stakeholders.
- 3.1.5 Mental, emotional preparation is also necessary. The person who will carry out the interview should have empathy and should think over "what would I do if I was in the place of the company representative.
- 3.1.6 In addition to the overview an outside picture should be established about the business itself to understand its operation. Typical information includes:
- understanding the business of the projected partner through reading company brochures and other publicly available company documents and information on the website;
 - organisational structure;
 - ownership, size, turnover;
 - product range;
 - target consumer groups;
 - visual observation of the products of the company and of its main competitors in the shops;
 - the technical level of the technology applied (as much as is possible).
- 3.1.7 Working in industry interest groups like working parties of the food industry federations and associations as an independent, voluntary, technical expert provides a good opportunity to develop a deeper understanding of the problems of the industry, for which solutions are necessary and to understand the explicit, hidden and future needs of the food industry for meeting the challenges created by the consumers, retailers' requirements, competitive market and legislation. Thinking and acting as a member of the

team of the industry representatives not only helps to understand the way the industry thinks, their priorities, time scale and practices, but it also provides an extremely valuable opportunity to discuss ideas and research solutions. This feedback from the fellows in the industry is particularly valuable at an early phase of the design and execution of the research project, when it can easily be incorporated into the concept and the research activity can be adjusted as necessary. Thus these informal discussions between the parties working together regularly represent an early and valuable verification of the research concept. The experience and knowledge learned through the regular exchange of views pays back the time input by the knowledge transfer personnel or researcher:

- 3.1.8 Meetings of the industry like general assemblies, annual conferences and the related social functions provide good opportunities for informal discussions and establishing the initial contacts with the companies for more detailed discussions for new project ideas.
- 3.1.9 Working relationships together with the social relationships based on regular collaboration help to develop mutual understanding, trust and openness between the researcher and/or knowledge transfer personnel and the industry managers.
- 3.1.10 In questionnaire surveys it is important to avoid ambiguity in the wording. It should be taken into consideration in the wording and development of the questionnaire that:
 - questions should be clear and similar in style;
 - personal, obtrusive questions and questions related to confidential information should be avoided (e.g.: Please provide the market share of your company)
 - questions should be simple, direct and should encourage participants to respond;
 - double negatives should be avoided;
 - overestimation of the respondent's ability to answer specific questions should be avoided;
 - several issues in one question should be avoided, one question should be focusing on one issue only.
- 3.1.11 For carrying out the survey clear general instructions and for each question clear, short and understandable specific instructions should be provided to the respondents as necessary to make it easier for them to answer (e.g.: Please indicate the extent to which you agree with the following statements).
- 3.1.12 During the preparation of the survey it should be planned how the respondent will be motivated to answer the questions. Motivation is influenced by the interest of the respondents in the subject, by the personal relationship between the interviewing organisation/person and the respondent, the time necessary for completion of the questionnaire, and the time the respondent can afford to give to this task.

- 3.1.13 Group discussions with participants from several companies can be used for exploration of the general and typical research and innovation needs - such as main research challenges, key trends, main research tasks, preferred subjects - of the food industry or a branch of the food industry. Various forms of group discussions applicable for this task include regularly operated working parties, committees, research panels of national technology platforms, industry research organisations and technical associations, food industry federations and branch associations, expert groups invited for a specific job, focus groups, etc.
- 3.1.14 Before the group discussion the main problem for which the answer is sought and the relevant objective(s) have to be defined.
- 3.1.15 For the effective use of the time careful preparation of the group discussion is necessary to ensure that the participants can be prepared in advance. Background materials on which the decision will be based should be prepared and sent to the participants in advance together with the main questions to be discussed as appropriate for the method used (e.g. focus groups have their own specific methodology).

3.2 Identifying R&D needs of the company

- 3.2.1 At the start of the meetings, after a brief personal introduction, it is crucial to explain:
- why the meeting was asked for;
 - the objectives of the knowledge transfer personnel ;
 - the goals to be achieved during this meeting.

It is important to show that the results are applicable to the products, processes, services, systems or markets of company and the knowledge transfer personnel is ready to help the company staff in implementing these results, strives to meet their needs and is open to their ideas. In the case of scepticism of the company management relevant examples can be pinpointed, showing how the knowledge and technology transfer fostered innovation and business success of other companies.

3.2.2 Getting an inside picture

Visiting an SME is like going into a stranger's house, one should be very polite and careful. The way of talking should be moderate, but unambiguous. The knowledge transfer person shall stress to the company representative at an early stage of the meeting that the confidential handling of all information will be ensured. The knowledge transfer organisation shall have procedures for ensuring confidentiality and the staff shall understand and implement it. The knowledge transfer person shall show confidence in the subject. Looking to the details is very important because this will make the "outside picture" (see 3.1.5.) clearer.

- 3.2.3 The knowledge transfer personnel should try to get a general understanding and overview of the level of knowledge and technical level applied in the company at an early phase of the discussion, so that an appropriate level of new knowledge can be offered.
- 3.2.4 The interlocutor is usually a senior manager or the CEO of the SME, or the R&D manager. People having different positions in the organisation need different ways of directing the discussion. It is important to understand the "mood" of the interlocutor:
- When talking to the CEO, the owner or a senior manager time is a very critical factor, since the senior manager usually won't have too much time to spend on this discussion. The target should be hit quickly but smoothly and gently. Direct questions such as "what do you think your company needs?" should be avoided. Having prepared for the meeting questions should be focused on a couple of topics in which the manager is likely to be interested. Once the area of interest is identified this track shall be followed. The CEO/owner has a "budget decision capability" e.g. he/she has a view whether the SME could invest and how much into the project concerned.
 - In dialogue with the R&D manager or the product manager time is also a critical factor. In this case the interlocutor has a more specific and detailed view of the problem or a project opportunity. He/she may have a better technical knowledge and understanding of the details, but has no "budget capability". More ideas can be discussed but a decision is not likely to be taken without the approval of the senior management.
- 3.2.5 Developing trust is an asset during discussions with the company. Successful practices rely on the mutual respect and the good relationship developed during the meeting. Also an amount of time is required to make people feel more confident. General questions shall be raised first, followed by more and more specific questions on technology, finance, R&D projects, problems which need a solution, research interests of the company, and future R&D plans. Asking sensitive questions should be avoided as much as possible; sensitive information should only be asked for when it is unavoidable. Care shall be made in the phrasing of the questions. The repeated re-assurance of confidential handling of the information is useful when asking such questions.
- 3.2.6 A better exploration of the real needs of the industry partners can be achieved through a dialogue than a monologue. Therefore it is a good practice to let the company representative talk about their business, their daily activities, the challenges they face, the ideas they want to develop, and the problems for which they need a solution. Being a good, careful listener is good practice.

- 3.2.7 Questions about the future plans of the company can help to identify areas of potential interest, especially when the knowledge transfer person can provide information about the relevant public financial support schemes and offer assistance in the preparation of the project proposal.
- 3.2.8 Gentle guidance should be provided to the industry partners to let them identify a problem first and then they should be encouraged to agree, that it is worth solving. When they have agreed that it is worth dealing with this problem and a solution would be useful, the potential solutions and actions can be outlined. Applying pressure and over talking should be avoided. Potential solutions can be offered by referring to the former experience of the knowledge transfer person and/or organisation "our experience shows.... do you agree?" When offering a solution for a problem several options should be provided with an explanation of their advantages and disadvantages.
- 3.2.9 During the meeting notes should be taken. Questionnaires and aide memoires are useful tools for the technology transfer person for recording the information. A template of a questionnaire is shown in Annex I:
- 3.2.10 After the visit it is important to follow up of all the questions raised by the company and recommending them potential solutions and/or knowledge providers with contact details, referring to publicly available information.
- 3.2.11 After the meeting the notes of the discussion should be reviewed, while the memory is still fresh, in order to fill in any gaps in the notes and decipher any cryptic notations.
- 3.2.12 When interviewing business representatives their time limitations spent for responding should be considered. The number of the questions should be kept as low as possible. When the time necessary to complete the questionnaire on general research needs is not longer than 15 minutes a relatively high response rate can be expected. It should be kept in mind that usually the response rate is reduced significantly by increasing the length of the time necessary to complete the interview. Up to 30 minutes for responding to a questionnaire on general research needs may be acceptable. When more time is needed for the response only those company representatives, who are really interested in the subject or have other strong motivations are likely to respond.
- 3.2.13 In addition to the personal visit phone interviews can also be carried out. Phone interviews are performed by only one phone call where the interviewer is presenting the questions via the phone to the respondents. Thereby, it is beneficial if the interviewer has sent the questionnaire to the respondent beforehand, so that the respondent can visualize the questions. During phone interviews the respondents may be less open than in their own environment.

3.2.14 For non-personal surveys, self-completed questionnaires are used and distributed via different channels. Normally, non-personal surveys comprise three steps. The first step is to contact the selected respondents of a sample in order to check their capability, availability and willingness to participate. Secondly, the appropriate respondents receive the questionnaires, fill them in and send them back. Finally, the researcher reminds non-respondents by phone or mail after the deadline for sending back the filled-in questionnaires. This step needs to be repeated until a sufficient response rate is achieved.

3.2.15 Where group discussions are applied they should be carried out under the guidance of a trained moderator, who

- directs the flow of the discussion to areas that are important for answering the main problem and the objectives of the task;
- highlights the important points and encourages the group to explore them and creates an atmosphere where all participants feel themselves comfortable and involves all of them in the discussion;
- summarises the main outcomes and summarise the conclusions.

3.2.16 The advantages of the group discussions are:

- one person's view or ideas may generate additional ones from the others;
- a more balanced view can be achieved through the collective knowledge;
- people are motivated by the opportunity for collective learning and exchanging experiences.

3.2.17 The disadvantages of the group discussions are:

- the participants do not express their specific needs and ideas to avoid disclosing confidential information;
- a strong personality may overawe the other members who either withdraw or simply agree;
- minority viewpoints may be lost;
- a negative attitude or opinion may influence the whole group.

3.3 Exploring hidden needs of the company

3.3.1 In addition to the explicit needs of the food businesses, hidden needs can be explored and new needs can be created by increasing the awareness of the firm of the available solutions, giving examples of their successful practical applications in other sectors or companies for similar tasks. The majority of SMEs prefer to follow successful examples and learn from each other, since by that way they can reduce the risks of failures, and the input of resources compared to the pioneers, who have to find the way first.

3.3.2 Awareness can be created by the following tools in descending order of impact:

- personal discussions;
- industry panels, focus groups and discussions in networks;
- workshops, small seminars with practical work;
- presentations at industry meetings;
- short focused summaries of results achieved with a focus to the benefits and practical use (1 page descriptions);
- articles in trade press;
- publication of some parts/findings of the results in a public domain;
- best practice guides;
- large conferences;
- newsletters;
- brochures.

3.3.3 For increasing the efficiency of awareness-creating activities about the available knowledge and for converting awareness into an interest to learn more about the subject, messages shall be repeated regularly with an interval not longer than 3 months and at least 3 times. The different tools listed in 3.3.2 should be varied and combined to achieve a greater impact.

3.3.4 The short explanation of the recent trends on consumers' expectations and preferences and their forecasted changes can be a useful tool for the knowledge transfer personnel in assisting the companies realise their hidden needs. The knowledge transfer personnel can develop a short overview of consumers' needs by desk research by reviewing documents produced by the relevant European Technology Platforms (ETPs), like ETP "Food for Life", publications in the trade press, publicly available reports from research projects, reports published by the European Federation of Food and Drink Industries (CIAA) and national food industry federations.

4. Dialogue between the industry and research

Summary

- Research results have to be converted into industry friendly format. Results should be presented through clear statements providing practical guidance in a simple language.
- A short overview of the available knowledge and the potential solutions should be ensured for the industry managers. Databases and regular newsletters presenting short summaries of results of several projects are very useful for this purpose.
- For provision of more detailed guidance for the industry on a specific subject in technical reviews, manuals, good practice guidelines and expert systems, the information and knowledge should be structured systematically. The principle of structuring information and knowledge should follow the way of thinking of the industry users.
- Mediators can provide significant assistance in establishing a dialogue between SMEs and research providers through collecting the needs of the SMEs, collecting the solutions, knowledge and expertise offered by the research providers and matching them appropriately. They can also help SMEs by organising and providing business supporting services for implementing innovation projects.
- Presentation of knowledge and research results shall be focused on the problem of the company which can be solved, on the potential solution itself and the main benefits which can be gained by the company through the application of that solution.
- Knowledge transfer to food SMEs should be carried out primarily in their mother tongue.

4.1 General need of collecting and structuring available information, research results and converting it to industry friendly format

4.1.1 One of the typical barriers of implementation of research results in the food industry is that the food businesses, particularly SMEs, may not have access to research libraries and databases on new research results; even if they do have access they may not have the motivation and time to search for information. Company staff often have limited time to read scientific publications and articles about innovative solutions, particularly if those are in a foreign language. They may not have time and skills to screen, extract and interpret the research results, and to relate them to their in-house problems. There may be a lack of motivation to invest more time to seek information in research literature in an initial phase of a potential innovation project.

- 4.1.2 Methods or tools which help companies to find the relevant information quickly can reduce these barriers significantly and if the information is converted into an industry friendly format.
- 4.1.3 For industry, different style has to be used to the style of scientific publications. Short sentences, and clear and simple statements shall be used, which are easily understandable for people not specialised in the specific subject. The use of long sentences, sophisticated scientific and technical terminology, foreign words and complex mathematical equations should be avoided.
- 4.1.4 Knowledge transfer to food SMEs should be carried out primarily in their mother tongue. The level of knowledge of English can be variable at SMEs, which can be a significant barrier to read or hear information on research results and to its implementation for innovation.

4.2 Databases on research results, overviews and research summaries

- 4.2.1 A way to help industry is to provide a regularly updated overview based on periodical syntheses of research results collected from publications or databases. This information can be transferred through personal explanation by visiting the companies and through dissemination of written information (i.e. newsletters, databases etc.)
- 4.2.2 Research projects funded by public money can be collated in a database. These contain typically the title of the project, an abstract prepared specifically for knowledge transfer purposes, which describes the potential applicability of the results in an industry friendly language and the contact details of the project leader and key researchers (name, address, e-mail, phone, fax, etc.). These abstracts may significantly differ from the original abstract of the scientific publication. The databases should be updated regularly. Existing databases provided by the national governments should also be considered and direct links should be established to them if they are relevant. For further details see Success stories 8.5 and 8.7.
- 4.2.3 Regular newsletters sent electronically free of charge are good means of creating awareness and interest. Such newsletters synthesize the practical aspects of the research results which can be applied in the food industry in a SME-friendly language. Teams from knowledge transfer organisations like the National Food Technology Platforms, food federations and other mediator organisations can write synthesis of scientific papers. For further details see Success stories 8.7; 8.9.
- 4.2.4 In discussion with the industry the use of the term R&D shall be avoided, rather the terms innovation and technology shall be used.

4.3 Structuring information for technical reviews, manuals, good practice guidelines, expert systems

- 4.3.1 The responsiveness of the industry to information on new ideas and solutions offered for specific problems can be increased if thematic overviews containing systematically collected, synthesised information are provided. This information should be collected from several sources by extracting the main statements, findings, data and results and should be organised into chapters, sub-chapters and paragraphs following the main ideas, principles, aspects, and the steps of implementation of a solution or a method. References to the original documents should be provided, indicating where further details can be found, when necessary.
- 4.3.2 For structuring the information in written syntheses of the knowledge of a field or discipline the following steps should be followed:
- Identification of the main objective, why the structured information is prepared, how it will be used.
 - Identification of the scope and the limits of the area covered.
 - Collection of the available information within the scope.
 - Reading through the information quickly, without going into the details.
 - Identification of 2-3 key documents, which can be used to design the logic of the written synthesis and to develop the content.
 - At designing the information for the industry the following aspects shall be considered.
 - What is worth to tell: what is the main message?
 - for the whole document
 - for the single chapters/parts
 - What are the proposed solution(s), method(s)?
 - Who is the target audience?
 - What is their technical and cultural background?
 - What is the style of the information they prefer?
 - Are the messages clear?
 - Is it not possible to misinterpret the phrasing applied?
 - Specification of the structure, table of content of the document, identification of the main chapters, main headings, subheadings.
 - Reading through the information sources, publications, books and systematically extracting the essential information and recording it within the specified structure. Adding identification for references.

- The attention shall be focused on the new, additional information compared to that, which is already in your file.
- Reviewing the collected information and editing it.
- The value of this information can be increased if it is kept under document control with version numbers, date and page numbers. Thus the structured review material can be updated regularly, when a new piece of relevant information is found. The version number and the date of the document/page should be modified at each change.
- Drawing a flow-chart showing the sequence of the steps of a procedure, method, solution described in a publication can provide an effective tool for identification of the key elements of information, that have to be extracted and recorded.
- To keep the main body of the structured information concise and focused, those descriptions which contain many details, less frequently used pieces of knowledge or information not fully in the main scope of the document can be put into the annex.

4.3.3 Preparation of guidelines is described in chapter 6.16

4.4 Role of the mediators

- 4.4.1 Efficient transfer of knowledge and technology to SMEs requires more than technical competence. Professionals who carry out this job need also knowledge about the market, understanding the internal operation of the SMEs, communication skills, skills in managing an innovation project within an SME and also understanding the related factors influencing the success of the project from the point of view of the business.
- 4.4.2 Knowledge transfer is frequently performed by intermediates called mediators or facilitators. Mediator organisations can play a significant role in attracting SMEs for participation in innovation and learning networks (AIC 2008), (Sebők 2008) and fostering the exploration of the R&D results. This is particularly true for such mediator organisations which are closely associated with or owned by the industry, which SMEs trust, and which have well-established links with SMEs.
- 4.4.3 Such mediator functions are provided by national food technology platforms (NFTPs) set up by the European Technology Platform - ETP "Food for Life" (<http://etp.ciaa.eu/asp>), by the food and drink industry federations and associations or industry owned food research associations, carrying out R&D tasks specified and monitored by the industry. Some of the mediators working for the food industry federations amalgamated into the SPES consortium are called Techno-Scientific Mediators (TSMs).

- 4.4.4 Industry personnel, especially owners, managers, decision makers of SMEs have limited time to screen research results for identifying those ones which are relevant to their needs. Mediators can collect the specific needs of the SMEs for RTD solutions and record them in confidential databases, as companies are very scared of disclosing it to their competitors. They can screen the results of the research providers for potential solutions and contribute to converting them into understandable and applicable solutions for the industry and collect them into their database. Mediators can search the files containing the description of the needs of the companies and the offered solutions and results from research, and they can link the appropriate SMEs and RTD providers (see sub-chapter 5.3) (Annex 2). They can provide a balanced and independent view: a one-stop access point for all support services. Thus they can reduce the initial efforts of the SMEs and the time necessary to develop a formal agreement between the SME and the RTD providers by keeping the parties focused on the deal by assisting them in finding appropriate research partners, by reducing their technical, financial and market risks through shared cost innovation support services, and assistance in considering the interest of all parties, particularly for a fair agreement on IPR. They can assist in creating a dialogue between the two sides and in reducing and handling conflicts through promoting agreements with mutual benefits and shared risks. They can also help the researchers find SMEs interested in their results. Industry-based mediators can contribute to the efficient management of these networks. Mediators can identify training needs of SMEs and propose relevant training.
- 4.4.5 The mediator/technology transfer personnel should draw the attention of the SMEs to the consumer needs. Questions can be raised, to clarify whether the customer's needs have been explored, understood and considered and such activities can be proposed for inclusion in the project plan.
- 4.4.6 Mediators should collect the needs of the companies systematically and organise them into a database which can be used by the whole knowledge transfer unit for matching industry needs and potential knowledge providers (see example in Chapter 8.). At the same time the confidential handling of the needs of a specific company must be ensured.
- 4.4.7 Mediators should have a good overview of several disciplines and should have practical experience in the food industry preferably at SMEs like stakeholders (chambers of commerce, consultants, national/regional technology transfer centres). One of the roles of the mediators is to identify new trends and know-hows in food production and to transfer this information to the SMEs, to bring research and industry closer and to disseminate publicly available knowledge to the SMEs through several channels with specific focus on training. For effective "match-making" they should have a solid experience in the academy-industry interface, with a strong background in food safety and quality issues.

4.4.8 Discussion (both written and oral) with the industry requires specific communication skills (see 4.1.3). Concise and clear phrasing and focusing on the aspects of the practical application of the research results and the benefits for the user are essential.

4.4.8.1 Specific rules have to be followed for writing a scientific synthesis of scientific results for SMEs to make the communication more effective. Mediators shall be trained on written communication dedicated to SMEs. They should be encouraged to develop and upgrade their communication skills through participation in specific training. This is successfully applied in the federations and the NFTP in Belgium by a biannual training course.(see in 8.10).

4.4.8.2 Centres in innovation can also provide full solutions for industry. An example is provided in Chapter 8.8.

4.5 Dialogue with the research centres, universities and other research providers

4.5.1 The contact details and areas of scientific activities of the national centres of excellence (research centres, universities, high schools) can be collected into directories or databases. Simple databases like Excel tables are appropriate for this job when an SME needs support. The database allows the identification of the research partner. A website linked database on available knowledge and research results with a search function can also be a useful and quick tool. Both SMEs and mediators can search on the web.

4.5.2 During the preparation of a database of national projects as described in 4.2.2 there is a possibility of having a dialogue with many members of the scientific community. The efforts should be focused on those who represent a category of excellence. Long-term collaboration on this task opens a door to the dialogue with the acknowledged research providers. National Food Technology Platforms provide a good framework for this collaboration.

4.5.3 Regular communication should be maintained between the different stakeholders of innovation in the food sector: Meetings, workshops and exhibitions can be organised throughout the country, inviting companies, academia and technology centres. An experienced moderator or facilitator should guide the discussions during these events. The discussions can be made through specific round table sessions, exchange of information between researchers and industry representatives after an introductory presentation or as a part of a workshop (see 6.2, 6.3, 6.5, 6.10)).

4.5.4 Working groups can be organised to prepare joint activities, such as training programmes and events, or develop strategies and action plans to meet innovation needs. They can assist the NFTPs and the other mediator organisations in

communicating the regularly up-dated and grouped needs of the industry including SMEs to the research providers. The members of such working groups may include representatives of the industry, including SMEs, industrial research organisations or research networks, government institutions and agencies dealing with enhancing and supporting food R&D, who are responsible for spreading the information within their organisation or network. In the composition of the working group an adequate number of industry representatives should be involved to ensure that the industry aspects are well represented and properly considered. These working groups can also develop recommendations for funding bodies on research priorities of publicly funded research and innovation programmes, based on SMEs needs

- 4.5.5 Ensuring the confidentiality of certain parts of the knowledge and protection of the intellectual properties is an important aspect for the research providers (see 7.6). Therefore mediators should clarify with their research provider partners, which part of the information can be made publicly accessible, and which part should be disclosed only for some companies individually, solely in bilateral contacts only for generating their interest to start discussions with the knowledge provider on the exploitation.
- 4.5.6 Research organisations shall develop their marketing and sales strategy for exploitation of their R&D results (see 7.4.8 - 7.4.10). Mediators can provide assistance in designing and implementation of this strategy and through that they can contribute to the development of better relationships with the industry, which can be more effective than the use of sales agents.

4.6 Presenting a solution to the industry

- 4.6.1 After the first contact with the company a follow-up contact has to be organised by the mediator for provision of a response to the needs for assistance of the company, which were identified during the first meeting. The industry partner should be given appropriate feedback within 2-3 weeks. In an ideal case the feedback shall include at least one, potentially more options of solutions for the problem or at least suggestions for a step forward. If an appropriate solution or a step forward could not be identified within the available time this should be admitted honestly. It should also be indicated whether the search for a solution will be continued or it seems not feasible to invest further efforts.
- 4.6.2 Time and clarity of information are equally if not more important at this stage than at the identification of the needs of the company. When presenting a potential solution to a senior industry manager, especially to a key decision maker of an SME it should be kept in mind that the first 1-2 minutes have to be exploited to present the main points

and to attract his/her interest. If his/her interest is raised there will be more time for a more detailed explanation, if not the case is lost even if the industry partner is polite and shows a superficial interest. The main message should be thought over in advance and the speaker should focus on that.

- 4.6.3 The message should be focused on the problem which can be solved for the company and the potential solution for that and also on the main benefits which can be gained by the company, not on the features of the product/service. It shall be kept in mind that industry is mostly interested in practical solutions for problems not in theories, scientific statements and scientific publications.
- 4.6.4 Presentation of the concept and the solutions should be made by clear statements. Vague, ambiguous phrasing shall be avoided. Honesty shall be applied about limitations and risks.
- 4.6.5 When a solution, based on R&D results, is presented to an industry decision maker or an operational manager the following structure should be followed:
- What is the problem for which the solution is offered?
 - What are the areas of the potential application?
 - What are the tangible results for the practice: data, findings, statements and methods? What can be achieved and how?
 - What is new in the solution offered, compared to those which were formerly available?
 - What are the additional benefits compared to the former solutions and what are the benefits in general?
 - How does the solution work? The explanation shall be kept brief, focused and clear. How is it used? What conditions, facilities and other resources are necessary for its operation?
 - Are there any risks associated with it? It is important to be very honest about the risks and potential difficulties. A fair overview reflecting the reality is usually better received than the overoptimistic view.
 - Has somebody used this solution already? For which purpose? What are the experiences?
- 4.6.6 The decision-making always involves a level of uncertainty. At industry situations decisions have to be made in time. Part time results, information from research having some proof of reliability, but without final validation can also be useful if they support the decision.

- 4.6.7 SMEs are usually cautious about involving external partners in their innovation projects. Soft methods of convincing leaving time for the company to realise itself the need for external help are received usually better than hard selling methods.
- 4.6.8 Mediators shall maintain records of their meeting with the industry and research partners and follow up needs of the partners from the industry. They need to update their knowledge on research solutions regularly, by meeting people, reading articles, and assisting in conferences. Their activities shall be focused on the major problems of the industry. The information on the needs of SMEs for innovation and training activities has also to be updated regularly.
- 4.6.9 Last but not least the importance of managing a sensible direct and indirect communication has to be kept in mind (see details in Chapter 3):
- direct communication: during the exploration of the "outside picture" of the company the mediators can get a view on the typical style of communication of the industry partner and adjust their communication style to their preference (e.g. information on national language, acceptance of the use of scientific and /or technical words, speed of discussion, etc.) (see 3.1.4);
 - indirect communication: the mediator should explore the expectations of the company for non-verbal communication (e.g. dress code, gestures, etc.) and should take them into consideration for further meetings.
- 4.6.10 Management and staff of SMEs, particularly technical and production staff, frequently have difficulties in reading, talking and learning foreign languages. They are often reluctant to discuss their ideas in foreign languages. Therefore it is important that the information on new knowledge, on new initiatives and solutions shall be provided in their native language. Also the opportunity shall be provided to them to express their views in their native language. National technology platforms and industry-based mediators are very instrumental in converting the knowledge and solutions available in foreign languages to native language.

5. How to implement research-based knowledge at SMEs

Summary

- For successful implementation of the research-based knowledge repeated discussion, adjustment, testing and evaluation should be made between the company responsible for the project and the knowledge provider. Involvement of the research provider in the practical implementation of its research results is beneficial for both parties.
- The involvement of the knowledge provider in the adjustment is particularly important with SMEs.
- The ongoing interaction for review and adjustment will lead to mutual learning of the partners.
- A complete description of a solution shall include at least the explanation of the problem or the new opportunity for which the solution was developed, the identification of the area of the potential application, the short description of the method, the expected benefits for the users, the instructions and pre-requisites for its application.
- Databases which contain the information on research needs of the industry and the knowledge and solution offered by the researchers provide an effective tool for matching the appropriate partners. These databases should be kept confidential except a carefully selected part of the information from the research providers, which can be used for generating awareness.

5.1 Underlying assumptions

- 5.1.1 In this chapter the concept/term "research-based knowledge" is used in a wider meaning, including knowledge, skills and methods generated through research activities.
- 5.1.2 Implementing research-based knowledge in companies is the process of transferring scientific findings from the research organization to the company in a way that leads to physical realization of something new in the company; i.e. a problem solved, improved or new products, improved processes, services, systems or markets. Sharing knowledge is a two-way communication process between the research organization and their representatives and the company and their representatives.

- 5.1.3 A successful knowledge sharing process results in learning, at both an individual and organizational level. Learning may lead to a change of behaviour of an individual, but also at organisation level.
- 5.1.4 User-oriented R&D projects can provide a genuine opportunity for mutual learning between SMEs and research institutions. When theory-based knowledge, represented by researchers and experience-based knowledge represented by SMEs is being exchanged, it can result in increased competence, and more innovations in SMEs. For the research group the outcome can be increased knowledge about the needs, resources, and competencies of the companies, on which further innovation projects can be based, and identification of new research problems.
- 5.1.5 Research and implementation of its results in practice shall not be seen as steps of a linear process, where first there is research, which has to be completed and then the findings should be implemented. The following techniques for successful knowledge sharing presume that a process of implementation may start at different stages in a research process; in advance of and during the research process, and at the end of the research process, when the final scientific findings are completed.
- 5.1.6 Development of a solution is not a linear activity. During the application of the transferred knowledge in a project for a company there is a need for the knowledge provider to be involved into the repeated cycles of testing, review and adjustment until the solution fits well to the specific needs, requirements and facilities of the company. This is particularly important at SMEs. This follows the "chain linked model of innovation" (Kline, J; Rosenberg N (1986)).
- 5.1.7 It is necessary to differentiate the activities/techniques for knowledge transfer, depending on the target group of the companies by innovation behaviour (see 2.17 - 2.21) and the target audience within the company. In planning the activity one should start with defining the target group, and the participants' basic knowledge, their needs and goals of learning.
- 5.1.8 To achieve effective knowledge sharing and mutual learning in contact points between research organisations and SMEs, several of the following factors should be present:
- willingness of the SME to solve a problem;
 - motivation of the researcher to contribute to practical problem-solving;
 - goals of learning defined;
 - all participants are well informed and well prepared;
 - roles are clear and accepted by all;
 - trust;

- equality and respect of the different angles (theory-based vs. experience-based knowledge);
- clear conclusions on further activities;
- professional leadership.

5.1.9 Mediators can effectively contribute to the knowledge sharing and mutual learning by:

- planning and organising the meeting occasions and designing and selecting appropriate techniques to facilitate knowledge transfer;
- managing the knowledge sharing process, being in charge of the learning process.

5.1.10 There are different cultural traditions across Europe for communication between industry and research, as well as communication between different organizational levels. The utility value of the following techniques will differ.

5.1.11 There are two basic types of transfer of knowledge and technology. One of the basic methods is made through transmission of knowledge and technical expertise. The second basic method of knowledge transfer is made through incorporating new technology into the production processes of machinery, ingredients, and materials (Thomas, B 2000). SMEs that are potential users first have to become aware of the new knowledge and technology, and then they can evaluate it. They may use the technology after they have trialed it. The learning process takes place during this evaluation and trial phase. The information about the experiences on the new technology will be disseminated, and adopted by other SMEs. Alternatively as the SME collects more experience through further experiments, the information becomes more reliable.

5.2 Developing solutions, identifying additional research needs

5.2.1 To create awareness and interest in industry research results have to be converted into a practical solution for a problem. The presentation of a solution should have a completely different format and content than that of a scientific publication and shall be transmitted through different channels to the industry than to the scientific community.

5.2.2 Typical expectations and needs of the food industry from research and technology development providers include:

- solutions for a problem, including creative concepts for meeting customer / consumer technical, market and business needs better;
- identification of a new opportunity, which can be exploited through the use of the new knowledge;

- assistance in a solution for a problem (tools, methods, systems, established rules (relationships) proofs of concepts, decision support tools;
- information, data, which can be used for solving a problem;
- timely identification of a problem before it gets critical.

5.2.3 Companies, particularly SMEs, prefer those solutions which:

- have the biggest impact;
- have the quickest impact;
- have more permanent impact;
- involve the least effort from them;
- need the lowest expenditure up front;
- have the quickest pay back;
- are the easiest to implement;
- create the largest visibility to important people.

5.2.4 The provider or mediator of a solution shall have a clear view of what can be achieved with the solution and how it has to be implemented and he/she shall be able to formulate this into clear, unambiguous statements together with the following information:

- identification of the problem that can be reduced or eliminated by the solution and the causes of the problem or the new opportunities which can be provided by the use of the solution;
- expected benefits provided to the user;
- main features of the solution (as relevant);
- main attributes of the solution (as relevant);
- concise explanation of how to use the solution;
- prerequisites necessary for the installation and for the on-going application, such as facilities, equipments, hardware, infrastructure, human resources, other resources as relevant;
- clear explanation of what is new in the solution compared to the other / formerly available ones;
- limitations of the application;
- estimation of the time necessary for the introduction;
- estimation of the costs of accessing to the solution;

- estimation of the costs of implementation of the solutions;
- risks associated with the introduction of the solution;
- references to existing practical applications, if they are already available.

5.2.5 Some of the information listed above shall be communicated in a publicly available format to create awareness of the potential solution, while other information shall be provided to the potential users at a more advanced phase of the discussions during the preparation of an offer for a specific application (see clauses 4.4.4; 5.3.2).

5.2.6 For converting research results into solutions the R&D providers and the mediators should have a good knowledge and understanding of the problems of the industry that the solution is necessary for. This information can be collected from:

- own practical experiences, particularly from work at factory floor;
- regular, personal discussions with industry personnel or with mediators, technical advisers, etc., including personal visits to the companies and attending industry meetings;
- expert work for an organisation representing industry interests and needs, such as industry federations, associations;
- workshops for creating awareness and transferring the general part of the new knowledge to initiate practical application at new clients;
- focus group and organised industry panel discussions targeted on a specific subject;
- training courses at the beginning and end of the research projects;
- guided experimentation during the research projects;
- annual conferences, thematic seminars, workshops, during the research projects;
- open days;
- joint work with industry presenting the research project;
- technology and system audits;
- outreach activities towards the SMEs.

5.2.7 It is worth spending time on the discussions with people from other sectors and disciplines, mainly in the high-tech ones like ICT, manufacturing, biotechnology, nanotechnology, etc. particularly with those who have a broader practical overview. Adaptation of solutions and knowledge developed for other sectors provide opportunities for quick and cost effective innovation in the food sector.

- 5.2.8 Regular exchange of views with industry personnel, including the methods mentioned in the clauses 5.2.6 and 5.2.7 can be used also to identify additional research needs and targets.
- 5.2.9 R&D providers and mediators shall consider the expectations and needs of the industry, when they convert research results into solutions. These include:
- priority is given to use of the solutions, not how they work;
 - it is neutral whether the solution comes from new research or from identification of a new application of an existing knowledge or from a combination of these sources;
 - statements, information shall be easily understandable for industry staff;
 - the solution shall be applicable at the available facilities, resources.
- 5.2.10 The applicability of research-based solutions can be significantly increased by regular and systematic reviewing of the experiences of practical applications in the industry and using them for continuous improvement.

5.3 Matching industry needs and available solutions

- 5.3.1 The activities of the mediators for increasing the effectiveness of finding the appropriate partners for the SMEs and the researchers are described in sub-chapter 4.4.
- 5.3.2 It is advisable to keep databases on company needs confidential, not accessible for external search, otherwise food businesses will be reluctant to describe their specific interests because of the fear of disclosing it to their competitors. Similarly researchers may be reluctant to provide information in appropriate detail about their results and solutions for practical application, if confidentiality is not ensured. Therefore it may be worth having two levels of information of solutions offered by the researchers:
- one focusing on the key information for SMEs to create awareness and to generate contacts, which is public or the access is limited to the SMEs participating in the scheme;
 - one containing more details about the prerequisites of the implementation and further explanations, which is restricted for the confidential use of the mediators.
- 5.3.3 The collected needs of the industry can be used as an input for topics for the future publicly co-funded research calls. Specific advisory panels can be organised within the NFTP's and other mediator organisations. These advisory panels should be made of industry representatives and scientists. They can carry out the following activities:

- Collecting the needs of industry and the offers from the researchers.
- Matching the needs and offers for innovation,
- Forwarding the industrial needs to the most competent research centres.

Impartiality and transparency of the selection and recommendation of the appropriate knowledge providers is essential. In the case of several potential research partners meetings should be organised with the SME so that the SME itself could choose the most appropriate research partner for the project.

5.4 Implementation of collaborative R&D projects

- 5.4.1 Before the practical implementation of the transferred knowledge starts it is good practice to carry out project planning jointly by the partners. This includes typically the following:
- agreement on the common terminology, definitions;
 - clarification, discussion of the objectives, sequence of the activities and their interrelationships (inputs and outputs from their activities);
 - detailed discussion on the tasks, sub-tasks including objectives, deliverables, responsibilities, timing, resources (personnel, equipment, materials, other, etc.) samples, number of parallels, testing methods and their evaluation;
 - methods for monitoring the progress, evaluation criteria, responsibilities;
 - frequency of reviewing the results, responsibilities;
 - reporting, including interim and financial report.
- 5.4.2 It should be checked whether each partner understands properly its duties and responsibilities, since the cultural differences between the industry personnel and the researchers may cause misunderstandings.
- 5.4.3 It is a good practice when the experiences and results of the experimental work are discussed between the partners as they are emerging, not only at the set monitoring points. The regular exchange of views can generate additional ideas, which help the implementation and improve the efficiency of mutual learning.
- 5.4.4 The researchers should always keep in mind that the practical applicability within a limited time with the least necessary resources is a priority for the companies.
- 5.4.5 When joint work is carried out in production facilities the researchers shall strictly follow the company rules for visitors on hygiene, work safety, site security and confidentiality.

- 5.4.6 It is advised that researchers should spend some time in the factory if possible, to understand and observe the operation, for which the new knowledge will be implemented. Careful observations take time, but can help to identify the important details and generate additional ideas, which can be used for improving and adjustment of the solutions.
- 5.4.7 The experiences of the operators can provide useful information, particularly when troubleshooting is necessary.
- 5.4.8 Valuable information can be collected by reviewing the customer complaints, non-conformities, product closures and their causes and analysing them for trends.
- 5.4.9 The practical experiences can significantly develop the practical knowledge and skills of the researcher. However it should be kept always in mind that compositions, recipes, specifications, technical details, parameters, technologies and particular process steps are and many other practices and information may be intellectual assets of the clients. Therefore they must be kept confidential. All researchers have to consider carefully the aspects of confidentiality of any information related to the company or the project before disclosing it to other parties.
- 5.4.10 When experimental work is carried out in a factory environment with the assistance or under the guidance of the researcher, clear, simple written experimental plans and instructions should be provided in advance to enable the company staff to carry out the necessary preparations. These instructions should contain the description of:
- what has to be done;
 - how;
 - when;
 - quantity;
 - technical parameters as applicable;
 - minimum requirements for material quality as appropriate (detailed specifications are usually developed by the company);
 - sampling plan;
 - recording needs.

Responsibilities for carrying out these tasks are usually specified by the company.

- 5.4.11 The staff carrying out the implementation work should be trained on that job. Initial explanation to the R&D staff can be provided by the researcher. Usually the trained members of the company staff transmit this knowledge to the other company personnel involved into the implementation of the work.

6. Knowledge and technology transfer tools - how to handle different levels of competence within the companies

Summary

- Knowledge transfer activities can be targeted to creating awareness of industry personnel on research results; to assist learning of industry personnel and mediators; to assist learning of researchers, specialists, experts, to contribute to the implementation of knowledge in practice.
- For achieving different objectives different tools can be applied, which vary in necessary time input, in capability to support the recall of the provided knowledge later, in capacity of transmitting the knowledge to other personnel, in level of personal and interpersonal interaction, in cost, cost efficiency and accessibility.
- The combined use of several tools is usually more effective than the use of a single tool.
- Knowledge transfer tools are based on the use of one or several types of methods, which include personnel contacts, training, written materials, visual aids, practical demonstrations, conferences, seminars.
- Collective techniques to cover several companies at shared cost in an early phase of the innovation projects can reduce the cost of the knowledge transfer and can be combined with techniques ensuring confidentiality, when the R&D activity gets to a close-to-market phase.

6.1 General considerations

6.1.1 Transfer of activities on new knowledge generated by R&D can be targeted to different objectives:

- creating awareness, particularly of industry personnel;
- learning of industry personnel, including mediators;
- learning of specialists, experts, researchers;
- implementation of the knowledge in practice

6.1.2 For achieving the different objectives, different knowledge and technology transfer tools are applicable. Some of the tools can be applied for more than one purpose.

6.1.3 The combined use of several tools is usually more effective than the use of one tool by itself. The selection of tools should be in line with the knowledge transfer strategy of the transferring organisation (see Chapter 7) and the needs and preferences of the target audience.

6.1.4 Tools to create awareness of industry personnel comprise:

- presentations at industry meetings, seminars, conferences organised for the industry;
- seminars organised on a specific subject;
- personal visits to companies; personal coaching;
- discussions in expert panels, networks;
- short (1-page) research summary sheets;
- newsletters;
- trade press articles;
- posters;
- open days;
- booklets, leaflets;
- annual reports;
- project summaries (extracts, short descriptions on project web-sites);
- CD-ROMs;
- web-based self-assessment tools;
- brokerage events.

6.1.5 Tools to support learning of industry staff comprise:

- training courses;
- workshops with practical exercises;
- demonstrations;
- learning through collective research activities in networks;
- guided experimentation through R&D projects;
- personal visits;
- consultancy;
- transfer of personnel;
- short (1-page) research summary sheets;
- best practice guides;
- booklets on success stories;
- booklets on specific subjects;

- e-learning;
- web-based self-assessment tools;
- CD-ROMs.

6.1.6 Tools to support learning of specialists, experts, researchers comprise:

- scientific publications in impact factor journals;
- books;
- presentations at scientific conferences;
- participation in research networks;
- transfer of people, industry placements;
- personal visits;
- industry best practice guides;
- apprenticeships.

6.1.7 Tools to support the implementation of knowledge in a company environment are described in Chapter 5.4.

6.2 Awareness raising through seminars

6.2.1 Before the start of the research process workshops and/or focus group discussions can be used to refine the research problem, to motivate the industry for participation/contribution to the research project, and/or to involve industrial partners in research/project planning. The target groups are company managers, key staff responsible for/involved in the development and innovation activities of SME's, and researchers.

6.2.2 The researchers' role is to inform SMEs about the state of the art in the research field and to listen carefully to and respond to the SME's needs, expectations and suggestions. Mediators can provide guidance to researchers about the potential interest of the SMEs.

6.2.3 The recommended format is a dialogue-based workshop. Lectures should summarise the state of the art and be followed by group work and a plenary session to expose the experience-based knowledge of the problem. This method can be used to identify important framework conditions within the companies related to implementation of the new knowledge and also to identify hidden needs. Since theory based knowledge and experience-based knowledge have equal value for achieving the objective, a sound balance of the two angles (theory-based/experience-based) shall be ensured during the discussion. The mediator shall act also as facilitator/process leader.

6.3 Capacity building through training

- 6.3.1 The purpose of a training course at that stage is to develop skills and knowledge, build a competence base and facilitate an early start of the implementation process. This can enable participants from SMEs to take an active role in the research project, to improve their understanding of the research problem, and to contribute to the development of the concept and the tools. The target group is the SME personnel responsible for involvement in the activities related to the research project (product development, production process, laboratory or marketing) and PhD students. The researchers shall act as teachers.
- 6.3.2 The content of these courses shall include lectures, demonstrations, exercises, case studies and group-work. The focus should be more on the practical use than on the theory. Mediators shall be involved in the planning and organisation of the training course, they may participate as trainers and provide guidance on methodology.
- 6.3.3 According to the survey carried out in the project SMEs-NET - Networking European Food Quality and Safety Stakeholders (<http://smes-net.ciaa.eu/asp/home.asp>) the European food SMEs think that training is the most efficient means of technology transfer, followed by best practice guides, seminars and workshops, short descriptions of practical results, internet and networking. (See the guidelines for the design and implementation of the training activities to SMEs, TRUEFOOD 2008)
- 6.3.4 The identification of the training needs of SMEs is an important preparatory step to be conducted before starting with the organization of training events. A training needs assessment (TNA) to identify priorities for the SMEs (i.e., the missing knowledge, skills and gaps in food innovation, etc.) should be carried out through questionnaires / surveys, visits to SMEs and interviews. Additional information could be identified through focus group discussions. A focus group is a form of group interviewing to get information and point of views of a group of people (qualitative data) quickly. Focus group can be used as a separate data collection tool or in combination with surveys and other tools. Furthermore, existing published literature and documents should be checked (documents like SMEs-NET project results "Vision paper" available at <http://smes-net.ciaa.eu/asp/home.asp>, documents produced by organizations set up at EU level like EFSA and CIAA, documents from public and national organizations such as Food Safety Agencies, etc).
- 6.3.5 During the development of a training proposal the following elements should be included:
- Selection of the training methodology (seminar, workshop, practical demonstration through visits to research centres, individual or in-house training).

- Proposed participants (number, names and positions, etc.).
- Proposed logistics (venue, training facilities, etc.).
- Rationale for the training (TNA findings, other situational factors).
- Framework for the training that includes: title and content, training methods / activities (i.e., presentations, discussions, group exercises, etc.), training goals, training materials, time frame, list of possible trainers).
- Review and final evaluation.
- Budget and costs.
- Plan for follow-up.

6.3.6 After the implementation of each training event, a final evaluation should be implemented and a report should be prepared with the main findings. A template for a training assessment is available in Annex 7.

6.3.7 The final assessment will provide detailed feedback on the results and the impact of the given activity to draw conclusions on what has worked and what has not in order to create improved, more efficient training. Several tools can be used for the evaluation of training activities. It is crucial to choose the appropriate one; the most common ones are:

- Questionnaire or survey to get more quantitative data that could be structured with defined questions or with open answers.
- Focus group discussions that could be applied to get more qualitative data, to gather information quickly for a certain topic within a defined group.
- Test or laboratory activities to be performed in the case of a practical subject (e.g. new technology, new methodology, new instruments, etc.)
- Case studies

6.3.8 The main topics for the training assessment need to be defined and can include the following:

- content of the course;
- usefulness of the topics presented;
- length of the course;
- course methodology and pedagogical approach;
- practical impact (benefits) of the course;
- assessment of the logistic arrangements;

- overall appreciation of the course organization;
- suggestions for improvement;
- course - recommendation to other SMEs.

6.3.9 Evaluation criteria and values need to be defined. It is recommended to use a scale from 1 to 5: 1 = insufficient; 2 = sufficient; 3 = good; 4 = very good and 5 = excellent. Regarding the evaluation criteria the European Commission uses mainly 5 elements, which are as follows:

- **Relevance:** The appropriateness of the objectives of the training programs to the real problems, needs and priorities of beneficiaries (SMEs) that it was supposed to address. To what extent are the objectives of the intervention consistent with beneficiaries' requirements, needs and priorities?
- **Efficiency:** Evidence that course results have been achieved at reasonable cost and the required quality of the results/products/services achieved. How well were resources and activities converted into results? How were the quality of the results achieved?
- **Effectiveness:** The extent to which the objectives were achieved (i.e., to what extent did the implementation of dissemination activities contribute towards access of SMEs to research results and innovation in the food sector?)
- **Impact:** The effect of the training course on its wider environment and its contribution to the wider policy or sector objectives. The positive and negative, primary and secondary long-term effects produced by the intervention.
- **Sustainability:** The continuation of the benefits produced by the training course after external funding has been completed. The probability of long-term benefits and multiplier effects.

6.3.10 Drawing conclusions, lessons learnt and final recommendations at the end of each training activity and training programme are strongly recommended.

6.4 Guided experimentation during the research process

6.4.1 Guided experimental work can be used in user-oriented research projects involving SMEs. This technique is suitable in situations where it is possible to carry out experiments in a production area/close to operations, as a supplement to the experiments carried out in the research area. The purpose is to motivate the SME partner, to increase the skills within the company and to build a solid competence base for implementation of research results.

6.4.2 The target group is the staff of the SME partner/collaborator of the research project, involving different work functions/levels of employees. The researchers' role is to lead or take part in discussions of results, participate in problem solving, guide on the spot, or via a mediator/adviser working in this field. The SME partner(s) shall participate in the research project by carrying out experiments in connection with the daily operations in the company (example: climate experiments in the green house). The SME partner(s) can also participate by offering products, ingredients or packaging, which can be used by the researchers to perform the research.

6.4.3 There should be an element of continuous guidance for the SME staff and a place for dialogue and mutual learning between the SME staff and the researchers. Extended project meetings can provide a suitable field for knowledge sharing, collaborative analysis and problem solution. The mediator shall initiate the process, participate in planning, act as facilitator/process leader, and provide pedagogical guidance and support to the researchers and the company staff.

6.5 Annual thematic seminar/conference during the research process

6.5.1 The purpose is to create an interest for the research problem, to maintain the interest for the project, to prepare the implementation of research results to personnel involved and for the SMEs as a whole, to identify hidden needs.

6.5.2 The target group includes industrial partners/collaborators, trade organizations, food federations and associations, other companies/industry, and researchers. The researchers shall provide lectures and demonstrations. The content shall cover preliminary research results and examples of adjoining research projects/results (by guest lecturers), unexpected problems, etc. An active role shall be given to the industrial partner, for example a lecture on experiences about the research problem, utility value of preliminary results. Sufficient time shall be left for dialogue with the audience, questions and comments, focusing on potential utility for the industry as a whole. The mediators shall act as facilitator and contribute to the organisation of the event.

6.6 Presentations at industry meetings

6.6.1 Short presentations at seminars and industry meetings which are well attended by the industry are useful tools for creating an awareness for the research problem and the solution, that was developed for it during the project at an initial phase of the knowledge transfer process.

6.7 Personal visits

- 6.7.1 Personal visits are expensive but very efficient tools for knowledge and technology transfer. They can be used for identifying research, knowledge and technology transfer needs, creating awareness, generating projects, and provision of training, guidance and consultancy for SMEs and larger companies. They provide large flexibility to knowledge transfer personnel to deliver tailor made information and services to the industry partners.
- 6.7.2 Visits by researchers to companies, particularly to production, packaging, storage and distribution facilities can significantly contribute to the learning of researchers and increase their knowledge and understanding of industry practices and problems.
- 6.7.3 Visits to other research facilities also contribute significantly to the learning of researchers.

6.8 Participation in expert panels

- 6.8.1 Participation in expert panels is a specific form of networking. Regular meetings and professional discussions during the sessions can create trust and awareness between the panel members including industry managers. Short personal discussions in the breaks can provide an efficient way for preparation of meetings with several people within a short time on different, specific subjects.

6.9 Using the internet/project home page

- 6.9.1 The need for a website and the resources necessary for maintaining it up-to-date have to be considered carefully. A home page has to be a living one, regularly updated as the project progresses. (Not having a home page is better than a "dead" home page). (See an example in Chapter 8.6)
- 6.9.2 The purpose of the project homepage is to create interest in the research problem, to maintain the interest in the project, and to prepare dissemination of research results to personnel involved and to the SME as a whole. The target group includes SME partners/collaborators, trade organizations, other companies/industry, researchers, government institutions and the press. The researchers shall provide the description of the preliminary and the final scientific results, and prepare and publish articles. The content shall be information about the research project, activities, partners and organization and about preliminary research results and examples of/link to adjoining

research projects/results. The mediators shall act as an administrator, and provide pedagogical guidance in the home page design.

6.9.3 Web pages maintained for several years after the project had been completed provide an easily accessible source of information on the results achieved both for companies and also for researchers. Their role in enhancing transfer of knowledge is increasing with the increasing level of knowledge of using electronic information.

6.9.4 The information on the web site can be organised in such a way that the reader can easily find that part of the information in which he/she is specifically interested without reading through the whole information. Therefore specific attention has to be paid to defining the different levels of detail of information (summary, detailed articles, external links to referenced documents, etc. EuroPrevall 2009).

6.10 Training course at the end of research project

6.10.1 This course shall be a short one, last 1-3 days, with a certification of attendance, potentially a formal study at university level (e.g. further education module with credits). The purpose is to impart scientific findings to SMEs in order to stimulate them to improve, develop and innovate.

6.10.2 The target group includes people interested/responsible/involved in the specific field, participants defined by SMEs. The researchers shall present the scientific findings (teaching, lectures, demonstrations, papers).

6.10.3 The course content can be connected to a specific research project, or it can be connected to several interdisciplinary research projects. In order to support the delegates' ability to relate the theoretical knowledge to their work situation, it is important to perform these training courses, formal or informal ones, in a different way from an ordinary student course. The teaching shall be strongly dialogue-based, focusing on the practical use of the scientific findings.

6.11 Outreach activities towards the SMEs

6.11.1 The purpose is to facilitate the implementation of scientific findings in SMEs, for improved products, processes, services, marketing channels, etc. The target group covers people in charge of product development activities in the SME, production leaders, marketing staff, etc. The researchers shall present the research results and support it by popular articles, guidance and demonstrations. Researchers and/or

research assistants/advisers from the research organization shall visit an SME to help solving a specific problem. They shall carry out a dialogue with the internal staff, guide and support the internal staff on the spot in conducting experiments, R&D-activities, and, if necessary, provide assistance by mail or phone as a consultation partner during the entire development process.

6.12 Collective techniques - using networks

- 6.12.1 Networking can improve the efficiency of idea generation through learning from each other and can reduce costs of access to sources of new ideas by sharing costs between the network members.
- 6.12.2 A crucial pre-requisite of the participation of firms in networking is that the confidentiality of the specific R&D ideas of the company, particularly in the close-to-market phase of the innovation and also that of the details and figures of its business activity must be ensured.
- 6.12.3 For a major group of SMEs networking and collective research provide a more appropriate solution at least in the phase of the idea generation and preparatory and experimental trial phase of the project.
- 6.12.4 In regional networks and clusters, companies are collaborating with each other along the supply chain, or on specific, related products and services for combining their core competencies to develop a joint competitive advantage. The results are built into new products or services, i.e. the diffusion of the new knowledge is embodied. These networks provide clear benefits for their members, who are usually the typical "innovators" and provide their experiences on good practices of managing networks for the outside world. However they have limited influence on the diffusion of new knowledge and techniques to food SMEs beyond the membership of the network.
- 6.12.5 Regional clusters usually attract the most innovative companies, which have high growth capabilities, and a potential to develop radically innovative products, processes and services, e.g. the Technology Pioneers and Leading Technology Users. (see paragraph 2.18 in Chapter 2.)
- 6.12.6 The cluster manager has an important role in reducing the cultural and managerial barriers by effective communication, collaboration and by strengthening partnership, acting as an impartial interface between all stakeholders, setting up appropriate communication and networking tools, and ensuring predictable, continuous operation.

- 6.12.7 Usually the entrepreneurs are the gatekeepers within the group of the SMEs. The information and communication has to be focused on the gate-keepers within the SME groups or within a company (Thomas, B. 2004).
- 6.12.8 "Collective research" and related technology transfer and other collective activities are "carried out for the benefit of a larger community of SMEs and the results are accessible for all of them, while collaborative activities are performed by a limited number of companies on a shared cost basis for their own individual benefits" (adapted from CORNET 2006). Collective research combined with individual, confidential close-to-market R&D activities is a tool for SMEs to overcome their limitations in accessing new knowledge, skills, and human and financial resources to develop innovative solutions.
- 6.12.9 The barriers represented by the cost, which may be high compared to the financial resources of an SME, can be reduced significantly if the technology transfer and innovation support services are provided at shared cost by networks and clusters operated by industry federations, industry R&D organisations, and business support organisations. Collective research and related business support activities provide an efficient tool for involving SMEs in shared cost research technology transfer and collective learning, which require less resource, lower motivation and less entrepreneurship than initiating innovation projects on their own. Collective research provides an additional platform for participation in research for such SMEs, which do not have their own research capabilities.
- 6.12.10 Collective research (CORNET 2006) is frequently associated with trade associations, food federations or industry research organisations. Recently, national food technology platforms have started to organise collective research and innovation support activities. Typical activities in collective research include:
- the development/improvement of methods;
 - development of proof of concept knowledge;
 - exploring new techniques where the risk of failure is high;
 - preparation of technical norms, standards and best practice guidelines;
 - search for improved processes and materials of wide application in the industry, ensuring the wide dissemination of the results throughout the target business / SME community.

The experience gained from working in collective research networks during a precompetitive phase of a project, and from discussing typical failures, traps, and best practices of a new technique, technology or organisational solution can serve as a first step to involve SMEs into R&D activities.

- 6.12.11 Collective innovation generation and business support services can be provided through organisation of industry working parties for the precompetitive phase, which can be combined with confidential, face-to-face technical services and collective business support services in the following close to market phase. This method provides an alternative to regional clusters, for less innovation intensive sectors like the food sector.
- 6.12.12 The knowledge gained from collective research and the associated network learning activities can be exploited through follow up, company specific R&D projects based on a confidential, bilateral collaboration of the SME and the knowledge provider in the network in the close-to-market phase.
- 6.12.13 Thematic networks organised on the basis of common interest and shared costs, can attract many SMEs, potentially from different industry branches at national level - even from the "Early Majority" and "Late Majority" groups. The collective learning in these networks may generate a significant multiplication effect for the diffusion of the new knowledge into such SMEs that were not participating in the original network.
- 6.12.14 Industry working parties provide a shared cost opportunity to SMEs in the exploratory, idea generating, pre-competitiveness phase of innovation to share experiences with experts and peers, to learn from each other, to avoid typical failures without disclosing confidential information. This can be combined with specific confidential technical and consultancy services, when the specific project to be carried out has already been identified by the firm and additional business support services will be provided to help practical implementation and market access.
- 6.12.15 In working parties, the links between the firms in the network are looser and are focused mainly on joint learning, problem solving and exchanging experiences. The original knowledge is transformed by the comments of the firms into an industry friendly format, and is extended with practical skills and improved implementation methods; these are built into the knowledge base of the network operator. All partners and even future ones can benefit from this improved, implementation oriented knowledge.
- 6.12.16 Thus the nature of the networking in collective research is less confidential, less reliant on trust than for the regional industry clusters. A larger part of the knowledge can be made available by the network operator for new partners, than inside the regional industry networks.
- 6.12.17 It is the prime interest of the RTD provider to find the right balance between public and confidential information and promote the use of the new knowledge to further companies.

6.12.18 This type of transfer of new knowledge fits well with the nature of innovation in the food industry. The successful examples can convince many other companies about the benefits and feasibility of implementing the new knowledge. Although less collaborative business is generated directly between the members of the network, more companies are accessed, who can identify their potential local partners, more supply chains are involved, and more independent projects are initiated throughout the country in parallel, in different branches.

6.12.19 Participation in events which are attended by the companies provides a cost effective way to meet several companies within a short time, to create awareness of a subject, and initiate personal visits and discussions.

6.12.20 Networking with the industry and the research community can be used for creating awareness effectively.

6.13 Product development network - Nofima model

6.13.1 Since 1995 Nofima/Matforsk has been responsible for a Network Program aimed at the Norwegian food industry, funded by the Norwegian government through Innovation Norway. The programme is run as several individual projects. Each project has a defined and limited topic and objective. Each project is called a network. The overall objective is to transfer technology and competence and thereby increase innovation and competitiveness in the food sector.

6.13.2 The target group includes product development staff, product managers, production managers and operators, and marketing department of the food company. The researchers present the scientific findings.

6.13.3 The networks are aimed at different topics based on the need of competence from the food companies. A network consists of 5 - 10 companies. The organised part of each network stretches over a period of one a year. During this period the participants meet three to six times. Each meeting is organised as a mixture of lectures on theory, teamwork, practical testing of different tools, exchange of experience, discussions and process evaluation. Each participating company applies the theory discussed at each meeting to a realistic in-house project run between the meetings. A mediator, who is the network project leader, has total responsibility for the management, content, economy and performance of the network.

6.13.4 In other countries industry panels are organised following a similar principle. See Chapter 8.3; 8.4.

6.14 National Technology Platforms

- 6.14.1 National Technology Platforms are industry led initiatives unifying all stakeholders for a research programme, focused on serving the R&D needs of the industry through generating new knowledge and solutions, which can be implemented in innovation projects.
- 6.14.2 National Food Technology Platforms and networks of members of food industry federations include not only the Technology Pioneers and the Leading Technology Users, but are able to involve Technology Adopting and Basic SMEs as well.
- 6.14.3 National food industry federations play an important role in managing the NFTP's and they use frequently the expert assistance of research and technology providers, which are closely related to them.

6.15 Brokerage events

- 6.15.1 Brokerage events are meetings organised around one or a limited number of main topics for matchmaking requests and offers of particular technologies between companies, RTD providers and other service providers. The set of pre-arranged bilateral meetings in short rounds (typically ca 30 minutes) according to a schedule provide a cost effective way to discuss the needs and offers and to explore and evaluate future collaboration opportunities
- 6.15.2 To make the brokerage event efficient careful preparation is necessary by the organisers and the participants as well. Preparation and dissemination of a catalogue with partner profiles helps the participants to identify the appropriate partners for face-to-face meetings. Partner profiles should be collected in time together with clearly phrased descriptions of the industry interests for support and researchers' offers and/or competencies on specific technologies to provide a clear guidance for the participants about the potential partners.

6.16 Best practice guides

- 6.16.1 Best practice guides are useful tools to summarize practical experiences of the implementation of technologies, methods, technical solutions, research techniques, design principles, systems, marketing and business practices with particular focus on the experiences collected on the new developments in the area. The content shall be based on collective knowledge.

6.16.2 These guides shall be developed by a team made up of practical users of methods, technologies, complemented by technical experts in the area. The team shall systematically review all important aspects of the practical application and develop recommendations for the users. It has to be ensured that all important aspects and typical questions raised by the users are covered.

6.16.3 The guides shall contain explanation of the key steps and important elements of the methods and technology, highlight good practices and typical failures and traps, and explain risks and uncertainties. Practical tools like flow-charts, tables, lists of references, contacts for further information and specialist services shall be provided. It is useful to give an explanation of the main benefits and drawbacks associated with the technology or method.

6.16.4 Methods of development of a guideline:

- The text shall be developed through repeated discussions and corrections.
- A structure shall be agreed first.
- There are two typical ways of developing the text.
- Either the different parts are allocated to different members of the team, who develop the first version on their own. An editor edits this into a uniform document, which will be the basis of further discussions in several rounds with the team.
- A small core team prepares the first discussion material. This is discussed by a broader panel in several rounds and adjusted and extended as necessary.

6.16.5 The development of the manuscript needs several rounds of discussions and corrections (usually 3-4 rounds). The first rounds of consultations shall be made within the authors' team. A broader public than the team who writes the document can be involved in the consultations in the later rounds.

6.16.6 Typical stages of the development:

- **1st draft**

The objective is to collect the knowledge and ideas that can be provided within the team, based on the table of content and organise them into a logical sequence. During the discussion the missing parts, gaps, conflicting statements and potential extensions should be identified. It has to be checked whether the first structure is appropriate, or if it is necessary to reorganise chapters, or amalgamate or split them, etc. At this stage there is no need to spend too much effort on the introduction, summary, reference, annexes, etc.

- **2nd draft**

The content of the main chapters will nearly be completed from the technical point of view (e.g. all important details shall be covered), all major gaps filled in, the structure agreed or the necessary modifications agreed. The sequence of the paragraphs are checked more carefully within the chapters, and the elimination of repetitions and conflicts is continued. Collection of ideas for the glossary, references, annexes and the refining of style continued.

- **3rd draft**

Each paragraph should be checked carefully. Ambiguous, misleading messages shall be clarified, conflicting views discussed and agreed, and the sequence and the logic improved. A personal discussion is a good starting point. The discussion can be continued through e-mails. This is the most tiring, time consuming part of the work, when the shape of the final manuscript will be developed. The focus is on the logic of the material and the style. The development of the annexes should be started, inputs should be given to the glossary and the references, introduction and the summary. Broader consultation within a restricted target audience can be started.

- **4th draft**

Refining the text and the annexes and case studies to make it ready for a wider consultation through the internet for a broader public. Consultation with a broader public, which may include all interested stakeholders from the industry branch, technical discipline, etc. can be started. These people should be made aware that the manuscript is available for comments. During a personal meeting of the team of authors, all the minor details, which are not clear or generally accepted shall be discussed and agreed. The style is polished further.

- **Final document**

The comments received from the broader consultation shall be considered and built in as appropriate. The final format should be adjusted. The document should be circulated within the team and jointly accepted.

6.16.7 The role of the team leader is to ensure the management of the progress, to ensure the coherence of the content and the uniformity, and to edit the document.

6.16.8 It is important to agree on common interpretation and consequent use of the terms, and formulating them as the definitions at an early stage of the work.

6.16.9 SMEs can significantly benefit from best practice guides. They can find a collection of successful practices and methods tested by others for a specific subject in one place.

6.17 One page summaries of the practical results of the research project

6.17.1 The objectives, main tasks, preliminary and final results of research projects can be efficiently communicated at low cost to the industry through short descriptions. The research summaries shall be phrased in a different way to the abstracts of scientific publications. The focus shall be made on the applicable results for industry, information necessary to understand the potential for practical application of these results and some indication of the necessary facilities and equipment. A very simple practical style shall be used. The length shall be limited to maximum 1 sheet (2 pages). Contacts for further information shall be provided. These 1-page summaries should be prepared when the first results are available and regularly updated with the progress of the project (Annex 8; 9.).

6.18 Newsletters

6.18.1 Newsletters published by well-known mediators are an important way to communicate to SMEs. Communicating information through the newsletters of national federations, NFTP's or other relevant intermediates gives more importance to the message (Annex 6). High circulation at low cost can be achieved electronic newsletters, but if immediate interest is not created the likelihood that the information will be lost or action not taken is relatively high. Printed newsletters have higher distribution costs than electronic ones, but their reading rate is higher. They are more likely to get filed and used repeatedly, when it is necessary.

6.19 WEB-based self assessment tools

6.19.1 Self-assessment tools can significantly contribute to the learning of SMEs by benchmarking their knowledge and skills to key personnel of other businesses in their sector, geographical area or in Europe and indicating to them where they need to develop their knowledge and capabilities.

6.19.2 Major applications of self-assessment tools include innovation management: stimulating learning and generating a strength/weakness profile; strategic guidance and supporting organisational change, raising awareness and promoting innovation, marketing innovation management services and matching expertise.

6.20 Transfer of people between research and industry

6.20.1 The mutual understanding between the food business and the research organisation can be increased if a member of the research staff spends some time working in the food business. In that way the researchers will have a better understanding of the needs, problems and limitations of the industry and potential uses of the research results. At the same time such placements provide an opportunity for more informal discussions and explanation of the new method and the potential benefit of its application.

6.21 Posters

6.21.1 Posters can be used to create awareness in the industry by displaying the summary of the research results and examples of practical applications in places which are well attended by industry representatives, such as exhibitions, annual conferences of food industry federations, open days of research organisations and public rooms of research organisations.

6.21.2 On posters short, clear messages, concise descriptions and illustrations of the results can be presented.

6.22 Booklets

6.22.1 Booklets can be used for providing summary information to create awareness. They help to give an overview of the subject and to provide recommendations to the industry.

6.23 CD ROMs

6.23.1 CD ROMs are often used to provide interactive tools in a portable format. CD ROMs can contain electronic formats of publications, databases, decision support tools, videos, etc. CD ROMs should exploit the potential of using advanced graphics and voice systems.

6.24 Annual reports

2.10.1 Annual reports can provide a good overview of the main research achievements, services and facilities of a research organisation offered to industry. They are tools to create awareness.

6.25 Trade press articles

6.25.1 Articles summarising the objectives, methods, main results and potential practical applications published in the trade press are useful tools to create awareness in industry. These articles should be written in a clear, simple style. The use of long sentences and complex technical terms should be avoided.

6.26 Scientific publications

6.26.1 Technical staff of food businesses, particularly SMEs, usually do not read scientific publications in impact factor journals. They usually do not have the time or the skills to read scientific journals and do not have an access to scientific libraries. Therefore scientific publications in their original forms have limited impact on industry. The results should be converted into other tools, providing more friendly format and style.

6.26.2 Scientific publications in reviewed journals are the most effective way to get verification of the scientific value of the research work and feedback from experienced scientists working in the same scientific area; this can be used for improvement of the knowledge and the methods. Scientific publications are the most effective means for dissemination of the results to the scientific community.

7. Managing the knowledge and technology transfer process

Summary

- For effective knowledge transfer partners should make efforts to understand the objectives and priorities of the others and respect these. This will contribute to the development of partnership in the longer term. A certain level of trust among the partners is a key element for success in technology transfer.
- All beneficiaries of research funding from public money should prove that their activities bring benefits for society.
- For management of the knowledge transfer activities at SMEs the common management practices should be applied such as defining the objectives, allocation of responsibilities, monitoring of progress, and reviewing the results achieved against the original targets.
- For successful implementation of the knowledge acquired SMEs need complementary support services to bring the new products, processes and services to the market. Complementary support services include among others: assistance in management, marketing, finance, business development, innovation management and legal issues
- These services can also be provided collectively at shared cost.
- For successful exploitation of knowledge generated by research in the private sector the protection of intellectual property shall be ensured.
- Research organisations shall identify which results of their research activities can form an intellectual property and they should take measures to protect it.
- Contracts should reflect the interest of all partners involved. Standard contracts with the potential of flexible adjustment can help to reduce the amount of efforts necessary to prepare such agreements, where all important aspects are properly covered.

7.1 General considerations on partnership in research collaborations and knowledge transfer

- 7.1.1 For successful and effective collaboration between industry, the research organisation and the mediators each partner has to understand what is important to the others and should respect that.

7.1.2 For improving the effectiveness of collaborative research and knowledge transfer the participants should follow two main principles (EUA et al.2008):

- It has to be demonstrated that benefits are achieved by the use of public money for research;
- Participants should recognise that their success depends on the contributions of others.

7.1.3 These principles should be applied through implementing the following guidelines (EUA et al. 2008):

- Companies and public research organisations should make joint efforts to ensure access to world-class knowledge and skills.
- Parties should understand what each of them has to offer and what each requires. They have to align the partners' interests.
- Each partner should determine the role of collaborative R&D and knowledge transfer in meeting their own strategic objectives.
- Partners should organise long lasting relationships.
- Appropriate professional skills should be provided to support collaborative R&D and knowledge transfer.
- Partners should explore and agree what they expect to accomplish within the collaboration.
- Effective management of Intellectual Property (IP) should be ensured
- Relevant training should be provided to the personnel on competencies beyond IP and knowledge management.
- Innovation should be seen as a trans-disciplinary activity.

7.2 Management practices

7.2.1 Successful knowledge and technology transfer requires supervision and good management. The key for success in knowledge and technology transfer is effective communication between those who have developed the new knowledge and technology and those who can use it in their operations. Furthermore, key elements for successful technology transfer are the build up of trust among partners and the optimal use of human resources (Rouach, D. 2003).

7.2.2 Relatively few food SMEs use the opportunities in adopting new technologies, management and business development methods from external research partners and

specialists. Often this is due to the lack of practice of SMEs in working with RTD providers, time consuming preparatory steps, traps in the early phase and relatively high costs.

- 7.2.3 While implementing knowledge and technology transfer processes, monitoring and evaluation procedures should be taken into account to facilitate the success of the activity and to provide an assessment of the performance with focus on "results". Monitoring and evaluation are both concerned with the collection, analysis and use of information to support informed decision-making (EC, EuropeAid 2008).
- 7.2.4 Before starting with the implementation of knowledge transfer activities, the partners involved should define their objectives, their responsibilities, follow-up procedures and methods (i.e., development of standardised format for reporting, monitoring and evaluation reports, appointing persons for monitoring and evaluators that may be internal or external experts, organizing events to obtain feedback and evaluation, etc.).
- 7.2.5 Managers of SMEs need to monitor closely the progress of the innovation projects, with the assistance of mediators, by involving the researchers through obtaining feedback and evaluation by different methods (i.e., individual interviews, focus-group data collection, surveys, business meetings, informal contacts, field trips, etc.).
- 7.2.6 While large companies have internal resources to collect and combine the knowledge of different disciplines including R&D, management, production, engineering, finance, legal and marketing, and have capacities and structures for controlling their use during the entire process, SMEs do not have such capabilities and resources. They usually need external support and services provided to them at all stages in the innovation process, from idea generation to market launch to cope with these issues.

7.3 Complementary support services for SMEs

- 7.3.1 For successful implementation of the know-how, technology or expertise provided through the knowledge transfer SMEs need complementary support services to bring new products, processes and services onto the market or to apply innovative organisational or marketing solutions resulting in commercial benefits. These complementary support services should cover several disciplines, like
- managing innovation projects, commercialisation of R&D results, business skills, resource management;
 - knowledge and information management;

- networking skills, practices and benefits of participation in collective activities like collective research and collective marketing;
- financial and business development: business planning, presentation of business plans, negotiation skills, finance management, advice to access to financial support, assistance for preparation of funding applications, securing finance;
- marketing and marketing management;
- food chain management;
- assistance with contractual agreements;
- assistance to protect IPR rights related to new products, technologies and services.

7.3.2 These services should be provided ideally as a one-stop assistance by the mediator organisation through personal coaching and should be tailor made, following a structured approach.

7.3.3 The costs of these services, which may be relatively high compared to the financial resources of an individual SME, may represent a barrier to their use.

7.3.4 The readiness of SMEs to seek professional support for innovation management capabilities and business support services can be increased by providing them:

- services provided at shared costs by clusters, networks operated by industry federations, industry RTD organisations and business support organisations;
- tools to benchmark their activities against best practices and to carry out an easy to understand gap analysis so that they can identify the areas with most important need for improvement (IMP3rove 2007);
- success stories from other SMEs that demonstrate that improving innovation management and business management capabilities pays off.

7.3.5 A typical successful approach of delivery innovation and business support services for SMEs include the following activities(IMP3rove 2007):

- perform the initial assessment / company diagnosis;
- define the objectives;
- develop the concept to achieve the objectives;
- plan the implementation of measures;
- manage and/or support the implementation;
- review the results and the performance.

- 7.3.6 The business objectives developed with the SMEs shall include a clear view of
- what the company wants to achieve with the innovation project in terms of production volumes, turnover, profitability, market share/market penetration, product/process properties - consumer benefits, etc. (as relevant);
 - specification of the success criteria - "when do we think that we are successful?"
- 7.3.7 A delivery of innovation management activities should include the following practice (IMP3rove 2007):
- a clear indication of the business impact (objective for value creation);
 - a clear description of the different steps within the project, including how the steps are related to each other and how they contribute to the expected business impact;
 - description of the involvement required by the SME to ensure the success of the project (time, resource, expertise, facilities, etc);
 - a list of deliverables the SME will receive at the end of the project;
 - a formal hand-over of the deliverable to the SME and if necessary training in the new tools, processes and techniques that are part of the deliverables.
- 7.3.8 For achieving the longer term sustainability of the willingness for innovation of the SME - e.g. to maintain its trust in the benefits of innovation activities and to ensure its motivation for participation in further innovation projects in the future, systematic monitoring and reviewing of the results of the project should be encouraged by the innovation support provider. This shall include at least the following aspects:
- What was achieved?
 - Is it satisfactory, e.g. is it in line with the original business objectives?
 - What worked well, what made the project successful? How can these activities and practices be standardised and be used again?
 - What was wrong, how can these be corrected/modified for a better use in the future?
- 7.3.9 The interest of the SMEs can be raised by monitoring the progress of achieving objectives systematically (IMP3rove 2007). Monitoring is facilitated via the following clearly defined key performance indicators:
- ratio of ideas generated versus ideas successfully turned into innovation projects;
 - percentage of innovation projects that were successfully completed within the time, cost and quality targets;
 - reduction of time-to-profit in percent per year.

7.3.10 Performance indicators for the long-term impact that innovation management might have to include:

- number of projects turned into business success over a time period;
- increase in turnover generated with new products or services;
- profit generated over time with new business models or in new markets;
- number of patents turned into business success over time (not typical for the food sector).

7.3.11 The person providing business and innovation management support should (IMP3rove 2007):

- understand the client's company culture;
- identify and be aware of barriers of innovation within the client company;
- be experienced in the field of innovation;
- have a good relationship with the client at the staff level;
- have a general understanding of the technology and the markets (does not have to be an expert in the respective technology or market).

7.4 Management practices for research and knowledge transfer organisations

7.4.1 Research and knowledge transfer organisations should develop clear policies in relation to IPR, incentives and conflict of interest and ensure that these policies are communicated, understood and implemented by all employees.

7.4.2 The guidelines published by the European Commission (2008c) state that "The research institution should define and communicate a long-term strategy in relation to the management of intellectual property (IP) and knowledge transfer, including a strategy as to how these activities should be pursued. A written policy explaining how IP management relates to and supports the overall mission of the research institution should be developed, published and implemented. This policy should include guiding principles relating to the emphasis the research institution places on the financial and non-financial benefits of the effective management of IP exploitation and knowledge transfer."

7.4.3 It is recommended (European Commission 2008c) that the Intellectual Property Policy of the research provider should:

- ensure that inventions can be identified easily and, where appropriate, protected;
- make the research institution a more attractive partner by providing evidence related to the research institution's expertise in IP management;
- make inventions more visible to external stakeholders, in order to promote their exploitation (through licensing, etc.);
- promote the use of publicly-funded research results, including the spinning out of new companies;
- provide a formal incentive mechanism for staff to participate actively in knowledge transfer.

7.4.4 IP policies may cover the following issues as well (European Commission 2008c):

- ownership of research results and associated IP rights;
- rules applicable to "non-employees" of the research institution such as students;
- management, protection, and promotion of the exploitation of IP rights;
- negotiation of IP issues raised during interaction with industry (ownership of IP, confidentiality, etc.);
- incentives for researchers who participate actively in knowledge transfer;
- management of conflicts of interests;
- monitoring and reporting of knowledge transfer activities.

A more detailed explanation the IP policy, incentives policy; conflicts of interest policy related issues can be found in the guideline of the European Commission (2008c).

7.4.5 Research institutions should develop clear incentives for researchers motivating them to participate in knowledge transfer activities. The incentive systems should encourage staff to identify and protect IP and to promote its exploitation and specify clear rules of how all staff who are involved in these activities should benefit, when their input and performance is above and beyond their normal responsibilities. The incentive policy should be communicated to and implemented by all staff.

7.4.6 Research institutions should develop clear rules on avoiding and handling of conflicts of interests. These shall help staff to identify existing and potential conflicts of interest, establish procedures for reporting these cases and ensure that the independence, reputation and fair behaviour of the institute and its employees are not compromised. These policies should be communicated to all staff and implemented.

7.4.7 Adequate resources shall be provided by the management of the research provider for effective knowledge transfer:

7.4.8 An exploitation plan of the results should be prepared during the implementation of publicly funded research projects, as soon as the results are visible for the management of the project.

7.4.9 This plan should be reviewed regularly, but as a minimum at the end of the project.

7.4.10 Maintaining a register of exploitable knowledge from the first reporting period can provide valuable support to the development of the exploitation plan.

7.4.11 There are two commonly used alternatives to measure knowledge transfer: measuring the value of the knowledge transferred and measuring the transfer activity (European Commission, 2009). Performance indicators for the knowledge transfer personnel include

- the number of the company contacts made on innovative ideas;
- the number of projects/ research agreements initiated from the ideas explained;
- the percentage of innovation projects which were successfully completed;
- number of client enterprises;
- the number of SMEs returning for assistance in innovation ideas;
- revenues from contract research.

These indicators can be well used in the food sector:

7.4.12 There are further performance indicators of the technology transfer process such as:

- number of patent applications;
- number of patents granted;
- number of invention disclosures;
- licenses and revenues from licensing;
- number of spin-offs.

These indicators, which are frequently used in other sectors of the industry and service, are not always fully applicable for the food industry because of the specific nature of food consumption and food business.

7.5 Recommended practices for contractual arrangements for research and knowledge transfer between research providers and SMEs

7.5.1 The basis of agreements leading to the satisfaction of all partners and long-term collaboration is that the interests and priorities of all partners involved should be adequately considered. It is important to establish first what the parties want to achieve through the R&D collaboration.

7.5.2 The guideline of the European Commission (2007c) on improving the links of research institutions with the industry recommends the consideration of the following key elements during the negotiations:

- the need for openness;
- ensuring compatibility with the missions and objectives of the parties;
- identifying personnel having authority to sign the agreement;
- identifying persons at each party who are responsible for project management and monitoring and specifying the operational rules for the bodies carrying out these tasks;
- distribution of rights between the parties, including access rights foreground and background;
- confidentiality;
- IP enforcement;
- relationship management and dealing with disagreements;
- governing law;
- state aid rules

More detailed guidance can be found in the original guideline document (European Commission 2007c) and in the Commission Recommendation (European Commission 2008c).

7.5.3 Typical types of research agreements include:

- research grant;
- research contract;
- collaborative research agreement;
- research service agreement.

7.5.4 Research grant is a funding agreement, which is focused typically on exploitation of a new area. Grants are typically funded by government, but also by industry.

- 7.5.5 Contract research is an R&D activity, which is funded by the companies or third parties, where all research is performed by the research organisation. Contract research is a typically straightforward agreement to complete a well-defined task.
- 7.5.6 Collaborative research is an R&D activity, where the company or a group of companies and the research organisation participate in the design of the research project, contribute to its implementation and share the project results. Collaborative research is typically longer term and more open ended than contract research.
- 7.5.7 Research or technical services are specialised technical activities carried out mainly by using the equipment and the existing know-how of the research provider for the need of the client who funds the activity. If only the existing expertise and equipment is used this may take a form of consultancy.
- 7.5.8 A collaborative research agreement should cover typically the following parts (EUA et al. 2008):
- definition, identification of parties, objective and partner selection;
 - confidential information;
 - scope;
 - resources;
 - funding and pricing;
 - governance and coordination;
 - reporting;
 - publications and confidentiality;
 - access rights to background information;
 - ownership of foreground;
 - patents and other IP;
 - licence for use;
 - diligence.
- 7.5.9 The use of standard contracts, which can be adjusted to the specific case with limited efforts can provide an effective tool for preparation of contractual arrangements (DI; Rektorkollegut 2004).

7.6 Protection of intellectual properties

- 7.6.1 New and novel knowledge, creative ideas, methods, systems, designs and solutions produced by the R&D activity are assets, which have a value. As valuable assets they can be commercially exploitable, particularly if they are converted into a private property, protected by the legislation on intellectual property.
- 7.6.2 In activities which are mainly focused on commercialisation of research results - e.g. on the development and transfer of technology rather than generation of scientific knowledge, the management of intellectual properties has great importance.
- 7.6.3 For several forms of the intellectual property rights there is a basic requirement to receive legal protection, that the knowledge, invention, method, etc. must not have been made publicly available by any means prior to the date of the filing for protection, e.g. it has not become part of the state of the art. Thus dissemination activities may compromise the novelty and the right for getting protection.
- 7.6.4 Participants of publicly funded research projects are obliged to disseminate their results, e.g. to make them available with specific conditions to other users as widely as possible and at the same time to protect their knowledge, which can be exploited by the industry and by other commercial applications. Therefore they have to consider:
- what elements of the knowledge generated by them or their project partners can form an intellectual property;
 - what measures are necessary and available to protect this intellectual property before they disseminate the results so that they can avoid the dissemination compromising their opportunities to protect this knowledge.
- 7.6.5 Exploitation of R&D results can be made through own production, collaborative research, contract research, consultancy, patenting, utility models, licensing and spin offs. Exploitation of R&D results having intellectual property right (IPR) elements can be made by the owner himself or with the permission of the owner by others through selling or licensing the intellectual property. Main types of intellectual properties related to industrial activities in the food sector include patents for inventions, utility models, trade secrets, industrial designs, trademarks and geographical indicators. This chapter is aimed at providing a short overview only. More detailed information is available in the referenced documents.
- 7.6.6 A patent gives the owner the exclusive right to prevent or stop others from making, using, offering for sale, selling or importing a product or a process, based on the patented invention without the owner's prior permission (World Intellectual Property Organisation, 2006).

A patent owner may give permission to, or license other parties to use the invention on mutually agreed terms (World Intellectual Property Organisation 2005.). The owner may also sell the patent to someone else.

- 7.6.7 Utility models are incremental inventions or small adaptations of existing products. Their requirement for being inventive is less stringent. The maximum duration of protection is shorter than for patents. Utility model applications or granted utility models may be converted into a regular patent application (World Intellectual Property Organisation 2006).
- 7.6.8 Trade secrets are confidential business information, which are not generally known to others dealing with that type of information. A trade secret has a commercial value because it is a secret; and reasonable steps have been taken by its owner to keep it as a secret. Trade secret protection does not require disclosure or registration; the protection is not limited by time, but it involves several risks. Others can work it out. If the secret is publicly disclosed its use will be free. The trade secret protection is effective only against improper acquisition (World Intellectual Property Organisation 2006).
- 7.6.9 Industrial designs may get exclusivity protection over the ornamental or aesthetic features of a product.
- 7.6.10 Trademark protection provides exclusivity over distinctive signs used to distinguish the products of one company from those of the others (World Intellectual Property Organisation 2006).
- 7.6.11 Geographical indications
- Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG) are geographical indications defined in European Union law to protect names of regional foods. The law ensures that only products genuinely originating in that region are allowed in commerce as such,
 - Protected indications are treated as intellectual property rights.
- 7.6.12 The research organisation which owns the new knowledge, may exploit it through contract research with businesses. There are different types of agreements, which usually all contain some confidentiality provisions for the information and results. The ownership of the intellectual property may belong to the funding organisation or the researcher (research organisation) or they may share it depending on the terms of the agreement negotiated before the start of the research.

8. Success stories

8.1 The involvement model

NOFIMA has developed an "integrated model", based on a stepwise procedure, where forming networks and clusters are used as important tools of knowledge transfer at an early phase of generating R&D projects (Fylling Jensen 2007). The model illustrates several steps at which collaboration between research institutions and SMEs can take place (Figure 2).

This model illustrates how an efficient set of means for communication, training and technology transfer can be organised into a system.

Transferring technology

from establishment to international research
- an efficient set of means

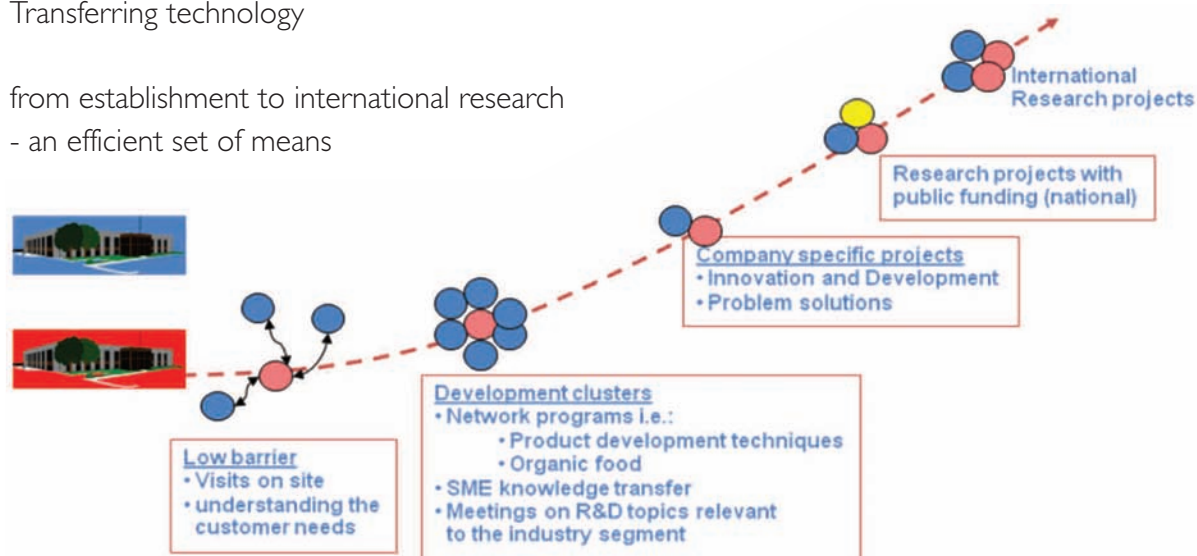


Figure 2: Involvement model

The success stories 8.2."The apple Blossom" and 8.14."Goat cheese from Undredal" are examples of how Norwegian food producers have used the system in their innovation processes.

8.1.1 Step 1 - outreach activities.

So called low barrier activities, where the research institution visits a company on site. Funded by Innovation Norway's value creation programme for food in the agricultural sector. - A political initiative to stimulate profitability through diversity of agricultural products of high quality and an added value in the market.

The Visit Scheme. In the visit scheme, a Norwegian company can be visited, free of charge, by an adviser relevant to its own business. This might be an expert in whatever technical area relating to food might be required. During the course of the visit, some actual work can be carried out as well as giving advice and a simple analysis to determine the current situation, potential and needs. The adviser can also point the way to other competence sources and possibly also public resources, based on the individual company's needs.

There are many good examples of small food producers who have received valuable assistance in areas such as:

- product and process development;
- test production of new products;
- shelf life and hygiene;
- requirements of regulations and customers;
- marketing and branding;
- design;
- distribution;
- price calculation;
- business development and strategies.

Some companies may also be offered follow up projects with a cost ceiling of up to NOK 30,000 (3400 €) and 20% company contribution.

8.1.2 Step 2 - Product Development Networks

Funded by Innovation Norway's value creation programme for food in the agricultural sector. The network programme is administered by Nofima / Matforsk on behalf of Innovation Norway. Norwegian companies with from 1 to about 300 employees have the opportunity to participate in networks under the Network Programme for the Food Industry. The networks are aimed at all sectors of the agriculture based food industry in Norway and are also open to companies that process fish.

The aim is to help companies towards more efficient production methods and higher product quality in existing or new food products.

A network is made up of 5 to 10 companies. Participants from the companies meet 3 or 4 times for theory, practical trials of methods and techniques and exchange of information and experience. Between network meetings, each company works on its own project. To help the project work an expert consultant is assigned to each

company who monitors the company's work. The networks are adapted to the participating companies, their needs and resources.

The networks cover a wide range of topics; here are some examples of networks which have been set up:

- product development of cured meats;
- internationalisation;
- niche products in the supermarket;
- healthy fat;
- safe cured meat products;
- small and far-seeing - a network for cheese producers;
- hunting for opportunities for bakers;
- innovation in practice.

8.1.3 Step 3: Company specific projects.

R&D-projects aiming at innovation, value creation and problem solving.

8.1.4 Step 4. The company is involved as a partner in national and regional research projects.

8.1.5 Step 5: The company takes part in International research projects, EU projects such as Prosafe Beef, Barley Bread, Double Fresh, Low Juice.

8.2 Epleblomsten - The Apple Blossom

After ten years in the city of Oslo, a young couple decided to move back to Telemark, and take over the family farm. The region Telemark accounts for more than 25 % of Norwegian fruit production. The young couple's vision was to make a sustainable enterprise and a decent living for two, based on original products from the family farm. For several years blackcurrants, apples and pears had been cultivated on the farm; this was an excellent foundation for development of new products.

To be in total control of the quality and taste, they decided to invest in a juice press. In this way they could make a range of labelled fruit juices and other fruit products.

At an early stage they realized that they needed help and advice for the product development process, particularly for packaging.

"Low threshold - outreaching" - a programme funded and supported by Innovation Norway, made it possible to contact a consultant from NOFIMA/MATFORSK, who visited them and helped them to identify their competence needs.

This was the start of a long and fruitful cooperation with research institutions. The enterprise - named "Epleblomsten" -The Apple Blossom - has, within a period of approximately six years, participated in open courses, open development networks at NOFIMA/MATFORSK, company specific development projects with guidance from NOFIMA/MATFORSK, and research projects. Gradually they have increased their personal and organisational knowledge, skills and methods as regards quality management, safe food/HACCP, packaging, consumers' behaviour, as well as general product development and innovation processes. Networking has given market access to the enterprise.

Today, The Apple Blossom is a blooming enterprise. Their products can be found in the high quality shops in Norway's largest convenience food chain, as well as in some fine restaurants and Farmers' markets - a meeting point for producers and consumers.

The enterprise continues with product development funded by Skattefunn (a tax-reduction system linked to development activities, funded by the government). They are partners in a research project about biogas. They also participate in Safe Fill, a EU-funded research project.

The Apple Blossom was awarded with Innomat, a national prize for innovation, and several regional prizes. In 2007 a special apple product was labelled (branded) as Norwegian food speciality.

Link: <http://www.epleblomsten.no/index.html>

8.3 Industry shared collective and contract research at Campden BRI

Campden BRI is an independent, membership-based food research and technology organisation based in the UK. The research association has 1600 member companies ranging from large corporations to small operations, drawn from 60 countries worldwide.

For the annual membership fee members get:

- full access to the results of the Member Funded Research Programme worth over £2.0 million per annum, get confidential technical and scientific support through prompt access to the expertise of over 300 food scientists, technologists, process engineers and information specialists involved in leading-edge research and development and associated services; cost-effective services;
- discounts on contract research, services, publications, training and conferences, as compared with non-members;

- regular information updates on Campden BRI R&D reports, publications, training and conferences;
- Newsletter, Food Law Alert (fortnightly by E-mail) and New Technologies Bulletin.

The core research programme is determined and funded by the members, and these members get exclusive access to the results. In addition, they have an inside track into details about research being funded at Campden BRI by UK government departments and the European Union, amongst others.

Industry is heavily involved in formulating the ideas for the member-funded research and in selecting the projects of greatest relevance. This ensures that the Member-Subscription-Funded Research Programme of Campden BRI is highly relevant to industry's needs - and enables Campden BRI to maintain and develop the skills and knowledge to solve industry's problems and anticipate future technical needs.

The relevance of the research programme is maintained through close interactions with members through the Scientific and Technical Committee (STC) and its twelve Technical Advisory Panels and the Working parties that support these. The STC is formed by elected representatives of the members and members have exclusive rights to participate in the technical advisory panels and working parties. The system involves around 1200 industrialists, with STC and each panel meeting three times each year.

STC oversees Campden BRI's scientific and technical activities at a strategic level, whilst the panels and working parties focus on particular disciplines and activities. Collectively they select and direct the research at Campden BRI and help shape many of the services.

Selecting research

In addition to developing research ideas and proposals, the panels and other members are involved in selecting which proposals are funded from member subscriptions through a system of voting.

Participation in panels provides an opportunity to members to be informed about the new trends and results of research and development in the discipline, collaborate with other companies to solve common problems, and discuss topical issues concerning the technical and commercial impact of emerging legislation, examining and discussing typical issues with industrial colleagues. Panels provide network opportunities for potential business partners and industry peers, and help industrialists to develop their professional abilities. Working parties typically steer a project, or help to develop a publication on best practices of a particular subject area.

In the research programme projects are grouped into a number of strategic themes. These themes are drawn from "The Needs of the Agri-Food Chain" - a document that encapsulates the scientific and technical needs of the food, drink and related industries, as identified through a triennial industry-consultation exercise undertaken by Campden BRI. As a consequence, the results of the research programme have considerable commercial value.

For each project, a concise description is presented together with details of the funding source, start and ends dates, collaborators, and project manager. Wherever possible, project managers provide members with further information about particular projects. Results of such projects funded by a group of members are confidential to them.

The commercial implications arising from each project are reported to members by a variety of routes:

- At appropriate stages during a project, Research Summary Sheets are produced and circulated. These are available to all members. Copies are also placed on the Campden BRI website.
- Regular progress reports and presentations are made to relevant Campden BRI panels and working parties, and reported in the Campden BRI newsletter.
- Reports are also made in greater depth through one or more of Campden BRI's regular series of publications: R&D Reports present detailed accounts of individual projects; Reviews cover broader areas arising from the research association's research programme or associated activities; Guidelines set out practical advice produced in conjunction with relevant industrial members.

Research Summary Sheets (RSSs) provide concise overviews of individual R&D projects. These projects directly benefit industry. They underpin the skills and knowledge needed to help industry innovate and resolve problems. They also demonstrate how new science can be converted to technology - which can be transferred to provide the members with a competitive edge.

The RSSs are essential in communicating the results of the R&D. They enable members to rapidly identify the developments of most interest to them. They are supplemented by more extensive R&D Reports which describe the projects in much more detail. The reports arising from projects funded by Campden BRI's members are available only to members, while those arising from projects funded by government and other agencies are not restricted to Campden BRI members. R&D reports are usually free of charge to members. Non-members can purchase only non-confidential R&D reports. (Campden BRI 2009)

Link: www.campden.co.uk

8.4 Collective learning in working parties

Campden BRI Magyarország in Hungary organises working parties on specific subjects for companies. Working parties have a set annual programme with 4-6 sessions in a year, providing a comprehensive overview of the developments and research challenges in the discipline. At the meetings participants get an update of the subject with practical demonstrations, and practical application aspects are discussed within the group. They can exchange views with other companies, identify good practices, and develop agreed views and approaches. The combination of presentations of new knowledge and discussion with peers provides an opportunity for SMEs for collective learning. Experiences of other companies help them to better understand the principles, practicalities and typical traps that have to be avoided. Working parties provide opportunities for networking.

Through participation in working parties SMEs get a cost-effective way of collecting knowledge in the preparatory, concept development and early trial phase of the R&D project. When the project gets to a company specific, close-to-market phase, activities can continue in confidential, collaborative work between the company and the research provider.

Link: www.campden.hu

8.5 Project database at FIAB

FIAB has created a database with all projects funded by public money. In this database it is possible to find the address, e-mail, telephone, and the main researcher. An abstract is enclosed, not with the results of the projects but with the possible applicability of the results in a friendly language for the companies (see: <http://www.fiab.es/index.asp?te=45&acc=ap>).

8.6 Actions of technology transfer undertaken by the Training and Dissemination Units - TDUs of the TRUEFOOD project

The TRUEFOOD - Traditional United Europe Food - project is divided into eight different Work Packages (WP) covering research, technological development, innovation activities, demonstration and training. A specific WP is dedicated to the knowledge and technology transfer activities (dissemination and training). The partners in the WP belong to 11 National Food and Drink Industry Federations (Austria, Belgium, Czech Republic, Denmark, France, Greece, Hungary, Italy, Portugal, Spain, Turkey). These Federations are grouped in SPES (Spread European Safety), a GEIE helping to promote and carrying out research and training in the food sector at a European level.

A Training and Dissemination Unit (TDU) was established in each National Federation. The aim of the TDUs is to ensure a structured link between research and industry. The 11 units implement training and technology transfer activities to SMEs, involved mainly in the production of traditional food. The Techno-Scientific Mediators (TSMs), working in the TDUs have the main responsibility for these activities. TSMs work in collaboration with the ETP "Food for Life" platforms and the National Food Technology Platforms (NFTP). See Points 8.7, 8.8 and 8.9 for practical examples of technology transfer activities provided by the Belgian TSMs in connection with the two Belgian NFTPs Flanders' FOOD and Wagralim.

Activities of technology transfer provided by the TDUs are e.g. personnel visits to SMEs, meetings and round table discussions, focus groups, direct e-mailing, periodical dissemination of information, workshops/seminars/courses/training on research results and food innovation issues. Some practical examples are provided in the following paragraphs by TDU FEVIA (Belgium). The dissemination of information is described in the following paragraphs and includes preparation of INFO-SHEETs.

The TSMs work on the identification of scientific papers from international and peer-reviewed journals. The selected papers are gathered in an Excel database. The papers have an industrial focus and/or applied results. The database is regularly updated. Each national TDU focuses on a number of food sectors and a number of topics (process, packaging, HACCP etc.). In Belgium, the database is used by the two NFTPs to prepare articles published in their newsletters (see Point 8.9: STW Flanders' FOOD).

Networking is organized to bring SMEs in contact with foreign SMEs and stakeholders. The objectives can be the exchange of best practices. For example TDU FEVIA (Belgium) organized a practical visit to France for ham producers. Half of the group was composed of SMEs. In two days, the participants collected satisfactory information to implement solutions for the development of their own activities in Belgium: public funding for a survey, revision of the specification laid down for ham, revision of the ham partnership agreement and creation of a new organizational body, organization of a conference for the meat sector, publication of one article in a regional newspaper, and trials of several new processes to produce hams and dry sausages.

From November 2007 until October 2009, about 8,500 European SMEs were directly involved in the activities of the TRUEFOOD project. More than 130 training events targeting 3,000 participants from the traditional food sector in 15 countries were implemented in cooperation with the research partners and centers of excellence of the project.

Knowledge transfer and dissemination activities are implemented by TDUs in different countries. In the followings some additional information is provided regarding the activities undertaken by TDU Federalimentare in Italy:

- INFO-SHEETS for quick information of project results targeting the food producers

An example of collecting and converting research results into industry friendly format are the 'INFO-SHEETs on main research results' developed by the Training and Dissemination Units (TDUs) from the SPES national food federations and the research partners within the TRUEFOOD project. These documents provide an easily readable and understandable summary of the main research results of the project for the potential users from industry and policy makers and authorities. The TDUs collect the research results with the help of the researchers and synthesise the results in the INFO-SHEETs that are disseminated to the SMEs and stakeholders through different communication tools (e.g. website, newsletters, e-mailing, etc.). Each INFO-SHEET contains information on the following aspects: brief description of the main research results, benefits for the SMEs, time and cost of applicability, actions to be undertaken for applicability, possible benefits for the consumers, list of suppliers (if available), relevant information related to the research result (i.e., training, conferences, scientific publications, information on EC and national legislation related to the main research results, etc.). The structure of the INFO-SHEETS is shown in Annex 5. Example of INFO-SHEETs are available in Annex 8 and 9. The Italian TDU has also edited and stamped an industry friendly leaflet containing flash news about the project results. The leaflet is distributed at the main events relevant to the food sector, training courses and any relevant meetings.

- TDU activities at Federalimentare

Italian TRUEFOOD Webpage

The Italian TDU Federalimentare created a web page hosted by the National Federation website: <<http://www.federalimentare.it/formazione/>> with the aim of establishing a constant flow of information between the TDU and the Italian SMEs, creating a useful technology transfer channel. The TDU is managing a database of more than 150 SMEs and other stakeholders called "The TDU Network". The participants are constantly in touch with the TSMs. Through the TDU web page all players in the food chain can gather information about the general aspects of the TRUEFOOD project and its related events at both a European and national level. A reserved area, restricted to the SMEs that are a part of the TDU Network, provides more confidential information, e.g. opportunities for SMEs at national and international level. In this regard, Federalimentare TSMs were deeply involved in the activities related to the funding scheme "Industrial 2015- Made in Italy" (closed on the 1st December 2008 and allocated 190 mil. €), in which several pillars of the Technology Platform "Italian Food for Life" had been taken into account. In particular, the TDU has taken care of the creation of two projects developed within "Industria 2015 - Made in Italy" funding scheme with the participation of Federalimentare Servizi, research partners (including TRUEFOOD ones) and industries (both SMEs and big ones).

Visit to SMEs

Thanks to the activities carried out within the TRUEFOOD project (training courses, meetings, etc), the Federalimentare TDU had the opportunity to discuss with the SMEs and other stakeholders their needs for innovation, the objectives and activities within the TRUEFOOD project and its results, funding possibilities and the state of the art in selected areas based on scientific development etc. During the training courses organised by the Italian TDU in several locations, the TSMs and research partners visited several SMEs. During the visits the TSMs and the experts identified problems and possible solutions for innovation, related to packaging safety in the food supply chain, new marketing strategies, improvements in quality and on the health functionality of products.

Quarterly newsletter

The Italian TDU prepares a quarterly newsletter translated into Italian (Annex 7.) and sends it to more than 150 SMEs of the TRUEFOOD Network. In order to give a focused tool to the SMEs, it has been decided to create a single newsletter in Italian for each commodity sector: processed meat; pasta and cereals; alcoholic beverages; fruits and vegetables; tea and coffee; bakery products and candies; vegetable oil and fats; dairy products.

With the aim of making it more "friendly" and captivating for SMEs, the newsletter has been divided into 4 sections:

- Events: containing the most important European and national events that could be interesting for Italian SMEs.
- Project results: a section updated with results from the TRUEFOOD project that, according to the IPR rules, could be published and disseminated. The Federalimentare' TDU summarizes information in a reader friendly way; it is very important to make the TRUEFOOD results as appealing to the SMEs as possible.
- Scientific articles: updated by the TDU with the latest scientific publications produced by Italian and European universities and research centres. In order to have the most up-to-date overview of the scientific publications, the Italian TDU uses various tools such as: subscription to "Italian Journal of Food Science"; research on internet; periodic visits to the libraries of research centres (e.g. CNR, ISS, Biotechnology Department of "La Sapienza" University); compendium of the annual Italian Congress of Food Science and Technology.

Each scientific article is summarized in an "easy-to-read" abstract and translated into Italian.

- TDU activities: all the training at national and European level performed and planned in the different phases of the project. The reader can find here any other initiatives developed by the Federalimentare Training and Dissemination Unit within the TRUEFOOD project.

8.7 Actions of technology transfer from the Walloon NFTP Platform WagrALIM (Belgium)

The Walloon Government launched in 2005 a regional plan called Marshall Plan, aimed at regenerating Wallonia's economy. This one billion euro project provided subsidies for a period of four years in five areas of competitiveness. The food-processing industry was identified as one of them. WagrAlim is basically a competitiveness cluster (www.wagrAlim.be). As several objectives of the Walloon strategy met the ETP requirements, it was decided that WagrAlim would act also as the Regional Food Platform for Wallonia (Walloon NFTP, Belgium).

The main activities of WagrAlim are dedicated to strengthen the competitiveness of food companies, mainly by launching calls for innovation projects in relation to four strategic axes (research and training activities). WagrAlim aims also to sustain innovation, providing technology transfer activities, networking and export expertise for food companies and surrounding stakeholders. Investment projects will be considered and supported in the near future.

The Walloon NFTP WAGRALIM (Belgium) established a Work Group (WG) called "Intermediation in Science and Technology" (IST FOOD) for food innovation aspects. The WG gathers partners from the Walloon NFTP, a TSM from the Belgian Food and Drink Federation, governmental representatives (Minister of Research and Technologies and one facilitator from the Agency of Technological Stimulation AST) and scientific representatives in Wallonia for research and education: the Technological Innovation Centre "Innovatech", several research centres, high schools and universities. Thanks to the WG, these centres of excellence are combined in a sustainable network, which facilitates communication between SMEs and research. The WG meets on a bimonthly basis.

The NFTP frequently receives needs on innovation aspects from food SMEs. It allows the centres of excellence to be aware of the latest needs from food SMEs. When receiving a need expressed by a SME, the WG decides what solution and services can be provided to the SME. Some needs are integrated into the research calls of the NFTP, some needs are directed to specific research partners (see example in the following paragraph). When no collaboration is found in Wallonia, the request is sent to scientific contacts in Flanders or abroad in Europe through the TRUEFOOD network.

A practical example is given on InnovaTech, a methodological operator in management of technological innovation in Wallonia, Belgium (<http://www.innovatech.be>). This centre delivers advice on technological innovation to SMEs from all economic sectors. A department is devoted to the food industry. The advisors help to structure projects from the idea to the product valorisation. They can be considered as facilitators between the industrial world and the research world. The services are provided free.

8.8 Fresh Concept: a biodegradable packaging for meat products

The company is a leader in the Belgian market in the slicing, packaging and distribution of "fresh & wrapped" meat products for mass distribution (140 different products), Fresh Concept (Belgium) employs fifty people. In 2007 the company dispatched about 8 million trays for 1,600 tons of cut and packaged cured meat products, with a €11.5 million turnover. The concept of "fresh & wrapped" is daily applied by Fresh Concept through lean production: large retailers (e.g. Carrefour, Cora, Intermarché) order in the morning and they are individually delivered on the same day.

Regarding innovation, Fresh Concept has been taking an interest in new packaging for several years. The food company focuses on the development of biodegradable packaging. Since 2005 they have been supervised by advisors in technological innovation from InnovaTech, the Walloon methodological operator in management of technological innovation.

"The advisors from InnovaTech provided a dynamic dimension and structured our project, says Christian Crismer, Quality R&D IT Manager. We knew we wanted to make new packaging but we did not have a clear idea of what it meant. Thanks InnovaTech we put a name on what we wanted to develop (innovation) and a method was suggested."

InnovaTech has been supporting this initiative by achieving several actions, e.g. a state of the art on this topic, the development of a partnership with scientific expertise and manufacturers of packaging. This led to the development of trials, the evaluation of the barrier properties of new trays and their certification in terms of biodegradability or compostability.

The company met the advisors when a first biodegradable packaging based on PLA (a renewable bioplastic derived from plants) was almost finalized. "The InnovaTech advisors noticed that we had completely forgotten to check if the market was willing to pay more for an ethical product. In fact, everyone talks about biodegradable packaging but nobody wants them because they are too expensive." Therefore, Fresh Concept directed the research activities to another innovation asked for by consumers. The company focused on the concept of a re-sealable packaging, an innovation for meat products packaged in expanded polystyrene. "A market survey conducted by CRIOC* found that less than 4% of the customers were willing to pay more for ethical products, against 64% of the same customers willing to pay for packaging that is easier to use, which could for example, ultimately substitute the Tupperware containers."

After 1.5 years of development, Fresh Concept is now testing a new packaging at an industrial scale. The tray shows good mechanical behaviour (in the fridge it does not bend under the weight of other food products and the product does not dry). Its launch is scheduled for 2009 or early 2010.

InnovaTech also helped Fresh Concept to build a network by introducing it to the NFTP WagrALIM. The company was invited to attend two specific events to bring scientific and technological providers in touch with companies (Hainova / Innov'Action events). Fresh Concept also undertook a training course in management of technological innovation. "InnovaTech made us grow, concludes Christian Crismer. This enabled us to gain maturity. The training course settled a methodology composed of discipline and common sense. Today we have fewer projects but greater results. This methodology is a state of mind. Whatever the sector and sub-sectors (labels, packaging, dry cured meat), all is applicable."

8.9 Actions of technology transfer from the Flemish NFTP Platform 'Flanders' FOOD' (Belgium)

Flanders' FOOD is the Flemish centre of competence/knowledge/innovation for food companies with production and/or R&D in the Flanders region. The centre was initiated by the Flemish government, IWT and Fevia Vlaanderen. Both small and large enterprises can join Flanders' FOOD, although SMEs are especially targeted (66% of the members).

The mission of Flanders' FOOD for the food sector is to improve the competitiveness by specific stimulation and implementation of scientific-technological innovation. Flanders' FOOD fulfils this role by:

- starting up marked-pulled collective research projects at centres of expertise,
- publishing a science and technology watch (STW) E-newsletter,
- organization of seminars and training,
- providing scientific-technological support,
- regional, national and international networking.

The Science and Technology Watch (STW) is a bi-monthly electronic newsletter. It is sent electronically to 1300 subscribers, active in the food industry, and it is free of charge. This newsletter presents practical scientific aspects applied to the food industry. The Flanders' FOOD team writes syntheses of scientific papers. The following themes are offered: Health, Technology, Ingredients, Trends, Quality and Conservation, Packaging, Sensory aspects, Food Safety. The article authors are all trained on a course on how scientific results should be presented towards SMEs in a non-scientific way. (An example is presented in Annex 3). Appended to the scientific articles, the agenda of technological transfer activities in the food domain is presented (training activities, conferences, workshops, seminars, project calls, etc.). The agenda concerns activities in Belgium and abroad.

To bring SMEs and research institutes together (besides research projects), Flanders' FOOD organizes on a regular basis (every 3 months) a session 'Where Science and Industry meet'. The aim is to introduce to the SMEs the knowledge and pilot infrastructure available at centres of knowledge. First a presentation is given, in which applicable results of the laboratory's research is summarized. Next, the laboratory is visited. Finally a small reception gives networking opportunities for the researchers and SMEs. Following these sessions, several SMEs and centres of knowledge have started working together.

8.10 Food Technology Network in Austria

In Austria the need for an efficient and competent transfer body specifically dedicated to the food industry was detected in the late 90's. In direct contact with the Austrian Food Federation (FIAA) the so called "Food Technology Network" was founded. Designed as a one stop shop skilled mediators are acting in this network as proactive contact bodies for the needs and ideas deriving from food companies, mainly SMEs. On the other hand these mediators manage the exchange between science and research through intensive contacts with the national and international food research scene. The network provides services such as project enabler and takes care of the efficient conversion of basic research in exploitable products for the food industry. Together with transfer agencies and ministries incentives in the form of specific dedicated funding programmes and schemes are elaborated.

8.11 La Morella Nuts, S.A. history and profile

LA MORELLA NUTS (www.morellanuts.com) was founded in 1985. It is a company that produces cocoa and nut derivatives as suppliers of the food industry, i.e. Nestlé, Kraft, Unilever, Danone, Leonidas, Kellogg's and small confectionery companies. The main products where its ingredients are introduced are biscuits and other cereal products, ice cream and chocolates. The expertise of the company is to design and develop innovative products to respond to new customer needs, in terms of taste, quality, safety, healthiness, and durability of products. To reach all these goals it has been equipped with modern equipment with high flexibility. Since the beginning of its business, R&D&I and quality activities have been present in the company. The first quality certificate was obtained in 1997 DIN EN ISO 9001:2000. During recent years they achieved the certifications ISO 14000, HALAL and KOSHER. In 2008 La Morella following the aim of day-to-day improvement was ISO 22000 certified. La Morella Nuts has been awarded on several occasions: Awards to the Best Spanish Food Company (Technological Innovation and Investment section) given by the Agriculture, Fishery and Food Ministry, and Technological Innovation Award from the Catalan Government, labelled as "Exceptional Unilever Supplier".

Since its foundation, the company has been performing intensive R&D&I activities. Always concerned with its customer needs, La Morella Nuts has designed and executed different research projects trying to add technology and high value to the customer's products. Since 2000 the company has developed several projects related to protective edible coatings, functional foods, improving of food processing techniques, and use of nanotechnologies partially funded by Catalan, Spanish or European Administration. During this period La Morella Nuts has been collaborating with Academia from Spain and abroad.

Due to the knowledge and experience acquired, since 2006, La Morella Nuts is the leader of a CENIT project called MET-DEV-FUN "Methodologies for the design, evaluation and validation of functional foods in the prevention of CARDIOVASCULAR and ALZHEIMER diseases". The consortium is composed of 9 companies (2 big companies, and 7 SMEs), 2 research centres and 4 universities (6 departments) from all over Spain with a global budget of 20,5 M€ over 4 years. This project was funded by the Spanish Government in the framework of the INGENIO2010 Programme.

As a result of these projects La Morella Nuts has 3 families of patents (in Europe, US, Japan) and several dossiers in preparation. They have published more than 10 articles in international journals (i.e. Journal of Agriculture Food and Chemistry, Journal of Alzheimer's Disease, Journal of Food Composition and Analysis, etc.) and Conferences (Vienna, Chicago, Salamanca, Malta)

Due to the activities in the above mentioned projects La Morella Nuts has increased its R&D Team (6 people full-time) and acquired expertise in the following areas:

- a) Characterisation of bioactive compounds, nutrients and other compounds present in foods.
- b) Obtaining of bioactive compounds and design of functional foodstuffs.
- c) Development of functionality validation tools.
- d) New product and process development improving shelf life, technological, organoleptic and nutritional value of ingredients and (in collaboration with customers) final products.

La Morella Nuts is a member of the ILSI (International Life Science Institute) and, in particular, of the Functional Task Force. Since 2009 La Morella Nuts has chaired AFTS (Spanish association to promote Supercritical Fluids Technologies).

8.12 Goat cheese from Undredal

The village Undredal, located in Nærøyfjorden in the western part of Norway, has a long historical tradition of goat milk production. Due to poor transportation they had to process the goat milk locally. Production of goat cheese was based on a strong internal discipline and a deep responsibility for the village's reputation of quality cheese products.

In the 1980's, some of the local goat milk producers in Undredal realized that, in the future, in a rapidly changing food market, this long historic tradition could be their most important asset. They also realized that they had to modernize the goat cheese production. There was a need to prolong the production season. They had to develop more effective work operations. They had to meet the food authorities' demands of food safety in non-pasteurized products. They had to fight through excellence, achieved by continuous development of knowledge, skills and technology.

In 1982 three of the local producers founded a company called Undredal Stølsysteri. In close cooperation with the local wholesaler, they gradually built a modern company with new methods, technology and production equipment.

Members of the three families are responsible for different tasks in business development and the daily running of cheese production.

The development of the company was built on the following principles:

Continuous development of knowledge and skills

There was a need to develop new knowledge and skills as regards cheese technology, marketing, new production methods as well as knowledge to establish and operate modern production equipment. During the last 20 years members of the three families have utilized a whole range of means (ref 8.1), from low threshold activities to participation in research projects, for the benefit of the company:

- Learning by doing, trial and error, in adjustment of production equipment;
- The visit scheme;
- Achieving cheese technology competence at ENILIA (Ecole Nationale d'Industrie Laitière et des Industries Agroalimentaires);
- Participation in R&D-projects, like SPIN-project "Hemming av listeria monocytogenes og staphylococcus aureus i bløte oster". With their experience-based knowledge and enthusiasm they contributed to research projects as The EUG-CR "Barrier for preventing pathogenic growth in cheese from raw milk cheeses" - "Safe Cheese" -(2007). Recently, they were involved in a new project funded by NOR-project "Listeria monocytogenes in small scale cheese production".

Focusing food safety

From the start the entrepreneurs have been cautious to build a fruitful dialogue with the local food authorities to find the best means and methods to control food safety. Gradually they

have won respect and acceptance. In 2003 Undredal Stølsysteri was the first Norwegian goat cheese factory to be certified for production and sale of non-pasteurized goat cheese.

Active use of governmental incentives

The Governmental Value Creation Programme for Food, Programme for Rural Development and other economic incentives from Innovation Norway have been utilized to finance competence development, labelling and marketing activities.

Networking

From the beginning, the founders understood the importance of cooperation and networking:

- In the 1990's the founders got in touch with a network of European traditional cheese producers, and they soon realized the importance of networking and cooperation between cheese producers on a national basis.
- They played a leading role in the foundation of Norsk Gardsost in 1997, a national special interest organisation for local cheese producers. The administration is located in Undredal. In cooperation with this organisation, they have shared their knowledge and experience by guidance and courses for other goat cheese producers all over Norway. Recently Norsk Gardsost initiated a project to develop national guidelines for small scale milk processing.
- The village Undredal is located in Nærøyfjorden World Heritage Park. Building local identity in close cooperation with local trade and industries has been an important part of the business process. Every second year a Goat Cheese Festival is arranged in the village. The company is member of ANKA, a local cooperative, aiming at "development of the natural and culturally based potential for value creation, through networking, building of labelling articles and entrepreneurship".

Results

Today Undredal Stølsysteri is approved as producer of high quality products. Their brown goat cheese is protected by the Slow Food Presidium. Their brown and white goat cheeses are sold in several gastronomic stores in Oslo and Bergen, as well as in Farmer's Market in Bergen and in several fine restaurants and hotels.

The company and its founders have received national prizes for their work on rural development and for quality food development.

9. References

- AUTM (2006): <http://www.autm.net>
- Capello, F: The IRC Network and the Transnational Technology Transfer Brokerage Event
- Confederation of Danish Industries, Danish Rector's Conference (2004): Contracts, Contacts and Codices - Research Cooperation Between Universities and Companies (DK): www.rektorkollegiet.dk/fileadmin/user_upload/download/Contacts_contracts_and_cod.pdf
- Drabløs, G, Wetlesen, A & Hagtvedt, T.: R&D-projects - an arena for mutual learning , ISEKI_Food 2008 Conference, Porto
- Rouach, D. (2003) 'Technology transfer and management - Guidance for small and medium-sized enterprises', Tech Monitor, May-June 2003, pp. 21 - 28.
- EUA, ProTon Europe, EARTO, EIRMA 2008: Responsible Partnering Joining forces in a world of open innovation. A guide to better practices for collaborative research between science and industry: <http://www.responsible-partnering.org>
- EURAB (2004) EURAB report on: SMEs and ERA EURAB 04.28-final ec.europa.eu/research/eurab/index_en.html.
- European Commission: Improving institutions for the transfer of technology from science to enterprises - Expert group report. Conclusions and recommendations. July 2004.
- European Commission (2007a): Improving knowledge transfer between research institutions and industry across Europe: embracing open innovation implementing the Lisbon agenda (4.4.2007)(COM 2007) 182 final Brussels
- European Commission (2007b): Knowledge transfer between research institutions and industry - Frequently asked question Memo/07/127 published on 04 April 2007
- European Commission (2007c): Improving knowledge transfer between research institutions and industry across Europe: embracing open innovation - Implementing the Lisbon agenda (4 April 2007 (Annex - Voluntary guidelines for universities and other research institutions to improve their links with industry across Europe.
- European Commission (2008a): Knowledge and technology transfer published on 14 April 2008
- European Commission (2008b), EuropeAid Co-operation Office, E5 Quality monitoring systems and methodologies, Handbook for Results-Oriented Monitoring of EC External Assistance April 2008
- European Commission (2008c): Commission Recommendations on management of intellectual property in knowledge transfer activities and Code of Practice for universities and other research organisations 10.04.2008
- European Commission, DG Research 2009: Metrics for Knowledge Transfer from Public Research Organisations in Europe, report from the European Commission's Expert Group on Knowledge Transfer Metrics.

- European Technology Platform "Food for Life: <http://etp.ciaa.eu/asp>
- EuroPrevall (2009):
- Filling-Jenssen, O. (2007) "How to successfully Engage Industry Advanced Food Research." Food-Frenz Workshop Cross-sector research - , F- Brussels 2007 www.foodfrenz.com
- ImP³rove project: www.improve-innovation.eu
- IPR Helpdesk: www.ipr-helpdesk.org
- Kearney A.T., (2006), House of Innovation [http:// www.atkearney. com](http://www.atkearney.com)
- Kline, J. and Rosenberg, N. (1986), "An Overview of Innovation", in R. Landau and N. Rosenberg (eds.), The Positive Sum Strategy: Harnessing Technology for Economic Growth, Washington, DC, National Academy Press, 00.275-305.
- Sebők, A.: "Enhancing the competitiveness of the SMEs" - Conference organised by the EC DG Enterprise and Industry: Promoting the leadership of the Agro-Food Industry 15-16 November 2007, EC DG Enterprise and Industry, Brussels
- Sebők, A: Addressing training and technology transfer: the ETP Food for Life SME Taskforce - CIAA Conference in cooperation of the European Commission on Competitiveness of European agro-food SMEs, 2 July 2008, Hotel Silken Berlaymont, Brussels
- SMEs-NET project (2006), Vision paper and national results:
<http://smes-net.ciaa.eu/asp/home.asp>
- SME Task Force (2008) Draft recommendations of the SME Task Force (Edited A.Sebők)
- Thomas, B. (2000) .A model of diffusion of technology into SMEs. WEI Working Paper Series, Paper 4, Welsh Enterprise Institute, University of Glamorgan Business School, Pontypridd
- The Australian Institute for Commercialisation (2006) Overcoming the industry- research sector - discussion paper <http://66.ausicom.com/publications.php> .
- TRUEFOOD project: www.truefood.eu
- World Intellectual Property Organisation (2005) Exchanging value. Negotiating Technology Licensing Agreements
- World Intellectual Property Organisation (2006) Inventing the Future. An Introduction to Patents for Small and Medium sized Enterprises
- http://etp.ciaa.eu/asp/nat_food_platforms/nat_foodplatforms.asp
- <http://www.campden.co.uk>
- <http://www.campden.hu>
- <http://www.federalimentare.it>
- <http://www.teagasc.ie>

10. Glossary

Background knowledge (or simply background)	Information (including inventions, softwares, databases, micro-organisms, etc.), whether IP-protected or not, which is processed by some of the partners before starting a R&D project.
Business network	A group of firms with restricted membership and specific, and often contractual, business objectives likely to result in mutual financial gains. The members of a network choose each other, for a variety of reasons; they agree explicitly to cooperate in some way and to depend on each other to some extent (Rosenfeld 1995a, p. 13).
Chain	A set of three or more organisations directly involved in the upstream and downstream flows of products, services, finances, information and/or knowledge from a source to a customer (Mentzer et al, 2001).
Cluster	An organised regional or multi-regional sectoral network gathering independent companies and associated institutions (in a "broad sense "economic partners and academic partners") aiming at improving innovation performance and international competitiveness (ABC-Network Benchmarking study, 2007 p6).
Cluster	Cluster can be defined as a group of firms, related economic actors, and institutions that are located near each other and have reached a sufficient scale to develop specialised expertise, services, resources, suppliers and skills.
Collaborative research	R&D performed by several companies on a shared cost basis for their own individual benefit.
Collaborative research agreements	Agreements, where both the firm and the research organisation participate in the design of the research project, contribute to its implementation and share the project outputs.
Collective research	R&D and other work performed to the general benefit of a large target group or broad segments within it, with the resulting knowledge being disseminated widely among them.
Competence	The requisite or adequate ability to perform a specific task, action or function successfully. For people it comprises a combination of knowledge, skills and behaviour utilised to achieve outstanding performance.
Consultancy agreements	Agreements, where the research organisation provides expert advice without performing new research.

Confidential information	Term used to describe information in whatever form that has the necessary quality of confidence about it, having regard to the circumstances in which it is created, disclosed or used, so as to attract protection under law (also known as "trade secrets", etc.).
Contract research	R&D contracted by one or several companies from one or several third-party research performers.
Contract research agreements	Agreements, where all research is performed by the research organisation.
Copyright	Copyright is the body of laws, which grants authors, artists and other creators protection for their literary and artistic creations, which are generally referred to as "works".
Corporate research	Research and Development (R&D) performed by a company for its own benefit.
Data	Symbols of facts out of context, and thus neither directly nor immediately meaningful.
Demonstration	Realisation of test bed sited and/or simulation sites, where, by means of physical and/or virtual prototypes the potential users can access the new technology.
Dissemination	<p>Any activity aimed at spreading among potential users the results of research.</p> <p>The disclosure of knowledge (i.e. the results of the project) by any appropriate means other than publication resulting from the formalities for protecting knowledge" (e.g. a typical example of what is not dissemination is the publication of a patent application by a patent office). Dissemination can, therefore, be seen as the means by which research results are presented and made known and accessible to a broad public and/or to specific research communities (i.e. websites, journals, conferences etc).</p>
European Technology Platform (ETP)	An industry driven instrument to unite stakeholders to enhance the competitiveness of the food sector through strengthening innovation and to meet the needs and expectations of the society better. Its activities include the development of typical documents including Vision for 15-20 years, a Strategic Research Agenda and a Strategic Implementation Plan, and implementing actions based on these documents. They cover research, innovation and enabling elements, including technology transfer. Specific attention is paid to SMEs.

Implementation in SMEs	Assistance to individual SMEs to introduce and apply the project results in their organisation.
Industrial design	The ornamental or aesthetic aspects of an article. The design may consist of three-dimensional features, such as the shape or surface of an article, or two dimensional features, such as patterns, lines or colours.
Information	Data placed within some interpretive context, and thus acquiring meaning and value.
Innovation	An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relation. The minimum requirement for an innovation is that the product, process, marketing method or organisational method must be new (or significantly improved) to the firm.
Innovation activities	All scientific, technological, organisational, financial and commercial steps, which actually, or are intended to, lead to the implementation of innovations. Some innovation activities are themselves innovative, others are not novel activities but are necessary for the implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation.
Innovation management	The concept of innovation management encompasses an integrated approach to managing all dimensions of innovation, from innovation in products, services and business processes to organisational and business models, through continuous monitoring, development and improvement processes.
Intellectual property (IP)	<p>Legal property rights over creations of the mind, both artistic and commercial, and the corresponding fields of law. Under intellectual property law, owners are granted certain exclusive rights to a variety of intangible assets, ideas, discoveries and inventions; and words, phrases, symbols, and designs. Common types of intellectual property relevant for the food industry include copyrights (including on softwares), trademarks, patents, utility models, (in some countries), know-hows, trade secrets, industrial design rights and geographical indications.</p> <p>A product of the intellect that has commercial value, including copyrighted property such as literary or artistic works, and ideational property, such as patents, appellations of origin, business methods, and industrial processes.</p>

Invention disclosures	Description of inventions or discoveries that are evaluated by the knowledge transfer organisation's staff or other technology experts to assess their commercial application.
Know-how	May or may not be a trade secret. Know-how generally refers to a broader group of internal business knowledge and skills, which would amount to a trade secret if the conditions for qualifying as a trade secret have been met.
Knowledge	Meaningfully structured accumulation of information; information that is relevant, actionable and based at least partially on experience.
Knowledge transfer	Knowledge transfer involves the processes for capturing, collecting and sharing explicit and tacit knowledge, including skills and competence. It includes both commercial and non commercial activities, such as research collaborations, consultancy, licensing, spin-off creation, researcher mobility, publication, etc. While the emphasis is on scientific and technological knowledge other forms such as technology-enabled business processes are also concerned.
Licenses executed	Include all licenses, options and assignments (LOAs) for all types of IP (copyright, know-how, patents, trademarks, etc.) Count multiple (identical) licenses with a value each of less than 500 Euros as one license. A license grants the right to use IP in a defined field of use or territory. An option grants the potential licensee a time period to evaluate the technology and negotiate the terms of a license. An assignment transfers all or part of the right to IP to the licensee.
National Food Technology Platform (NFTP)	An industry led instrument to unite stakeholders to increase competitiveness of the food sector through fostering innovation, born under the umbrella of ETP "Food for Life" taking into account the experience and the aim of the ETP, that focus its activities at national level.
Network	A firm's set of relationships with other organisations.
Non-technological innovation	Many innovations are of a non-technological nature, for example in areas such as marketing, organisation, management and design. They are not primarily driven by a technological invention or improvement, and hence referred to as non-technological innovations. The term is not unproblematic, however as technology (for example information and communication technology) is used as an enabler to support most of today's innovations, even when technology is not the main focus or driver of the innovation.

Mediator	A person, whose job is aimed at establishing a bridge between the industry and the researchers to improve the dialogue, the exchange of information and knowledge between them and to provide support for technology and knowledge transfer activities.
Patent	An exclusive right for an invention, whether a product or a process, which must be industrially applicable (useful), be new (novel) and exhibit a sufficient "inventive step" (be non-obvious). A patent provides protection for the invention to the owner of the patent. The protection is granted for a limited period, generally 20 year from the filing date.
Product life cycle	The life of a product in the market with respect to business or commercial costs and sales measures. The typical stages in a product life cycle are development, market introduction, growth, mature stage, saturation and decline.
Publication	Dissemination of research and technological development results through articles in e.g. (professional) magazines of a trade organisation or technical papers.
Research agreements	All contracts, where a firm funds the research organisation to perform research on behalf of the firm, with the results usually provided to the firm. Include collaborative agreement, where both partners provide funding and share the results. Exclude cases, where the firm funds a research chair or other research of no expected commercial value to the firm. Also exclude consultancy contracts.
Resource management	Resource management is the effective deployment for an organisation's resources when they are needed. Such resources may include financial resources, inventory, human skills, production resources, or information technology.
RTD	Research and Technology Development.
Skill	Learned capacity to achieve pre-determined results with efficient use of time, energy to both.
SME	According to Article 2 of the Annex to Recommendation 2003/361/EC, the category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises, which employ fewer than 250 persons and which have an annual turnover not exceeding €50 million, and/or an annual balance sheet total not exceeding €43 million (see SME definition). SMEs are the backbone of the EU economy - they represent 99% of all enterprises in the EU. Some 23 million SMEs provide around 75 million jobs.

Solution	A product, a process, a service, a method, a system, which is used to solve a problem of the business or a client.
Spin-offs established	A new company expressly established to develop or exploit IP or know-how created by the research organisation and with a formal contractual relationship for this IP or know-how, such as a license or equity agreement. Include, but do not limit to, spin-offs established by the institution's staff. Exclude start-ups that do not sign a formal agreement for developing IP or know-how created by the institution.
Technology transfer	The process of developing practical application for scientific research. A term used to describe a formal transfer of rights to use and commercialise new discoveries and innovations resulting from scientific research to an other party.
Techno-Scientific Mediator (TSM)	A person, mainly working in a Food & Drink Industry Federation with the aim is to create a bridge between industry and academia.
Technology Dissemination Unit (TDU)	A specific function established at I I food and drink industry federations for dissemination of the information on new research results and for promoting technology transfer.
Trademark	<p>A trademark is distinctive sign, which identifies certain goods or services as those produced or provided by a specific person or enterprise. The system helps consumers to identify and purchase a product or service because its nature and quality, indicated by its unique trademark, meets their needs.</p> <p>Trademarks may be one or a combination of words, letters, and numerals. They may consist of drawings, symbols, three-dimensional signs such as the shape and packaging of goods, audible sign, such as music or vocal sounds, fragrances, or colours used as distinguishing features.</p>
Trade secrets	Any confidential business information, which provides an enterprise with a competitive edge can qualify as a trade secret. A trade secret may relate to technical matters, such as the composition or design of a product, a method of manufacture or the know-how necessary to perform a particular operation. Common items that are protected as trade secrets include manufacturing processes, market research results, consumer profiles, lists of suppliers and clients, price lists, financial information, business plans, business strategies, advertising strategies, marketing plans, sales plans and methods, distribution methods, designs, drawings, architectural plans, blueprints and maps, etc. Requirements for trade secrets include that the information must be confidential or secret.

Information, which is generally known or readily ascertainable, is not protectable as a trade secret. The information must have commercial value because it is a secret and the holder of the information must have taken reasonable steps to keep it confidential or secret (e.g. through confidentiality or non-disclosure agreements with all those who have access to the secret information).

Utility models	Incremental inventions or small adaptation to existing products are protectable as utility models.
Value chain	Search for strategies that will provide superior added value in the eyes of customers. First the value can be created internally at company level, then via the chain. The value is created not only by one organisation but also by the other organisations in the chain.
Vocational training	Training of technical skills to handle or operate new products, processes or services to a group of SMEs.
Workshops	A session to transfer research and technological development results and the knowledge how to implement it in daily practice of SMEs.

II. List of abbreviations

CEO	Chief Executive Officer
CIAA	Confederation of European Food and Drink Industries
EFSA	European Food Safety Authority
ETP	European Technology Platform
ICT	Information and Communication Technology
IP	Intellectual Property
IPR	Intellectual Property Right
NFTP	National Technology Platform
R&D	Research and Development
RTD	Research and Technology Development
SME	Small and Medium Sized Enterprises
SPES EEIG	Spread European Safety European Interest Grouping
TDU	Technology Dissemination Unit
TNA	Training needs Assessment
TSM	Techno-scientific Mediator

Annex I: Template of questionnaire to collect SMEs needs in innovation/training activities

Questionnaire TRUEFOOD on Training needs (Belgium)

Information on the SME (optional)

Activity sector:

Company:

Title, Name and First Name:

Function:

Address :

City:

E-mail:

Telephone:

Selection of training themes

Please choose among the following training topics :

Interest for the topic
(1 = low, 5 = high)

Please precise exact titles corresponding for this topic :

Determination of consumer perception, expectations, and attitudes 1 2 3 4 5

Predictive modelling and risk assessment of traditional foods 1 2 3 4 5

Improving nutritional quality of traditional products in line with consumer demands 1 2 3 4 5

Improved marketing and food supply chain organisation methods for traditional food products 1 2 3 4 5

Environmental, societal, human and economic impacts of innovation 1 2 3 4 5

Other theme(s) : 1 2 3 4 5

1 2 3 4 5

1 2 3 4 5

Let's stay in contact..

I would like to receive general information on the project by e-mail by ordinary mail

I would like to receive the scientific results of the project by e-mail by ordinary mail

I would like to receive information on the next training by e-mail by ordinary mail

I would like to meet a mediator from the TRUEFOOD project yes: no

Thank you very much for your collaboration

Annex 2: Role of mediators in improving the knowledge transfer

Source: Sebők, A.: Addressing training and technology transfer; the ETP Food for Life SME Task Force, Conference "Promoting the Competitiveness of European agro-food SMEs", (2008)

Figure 3a: Sources of innovation

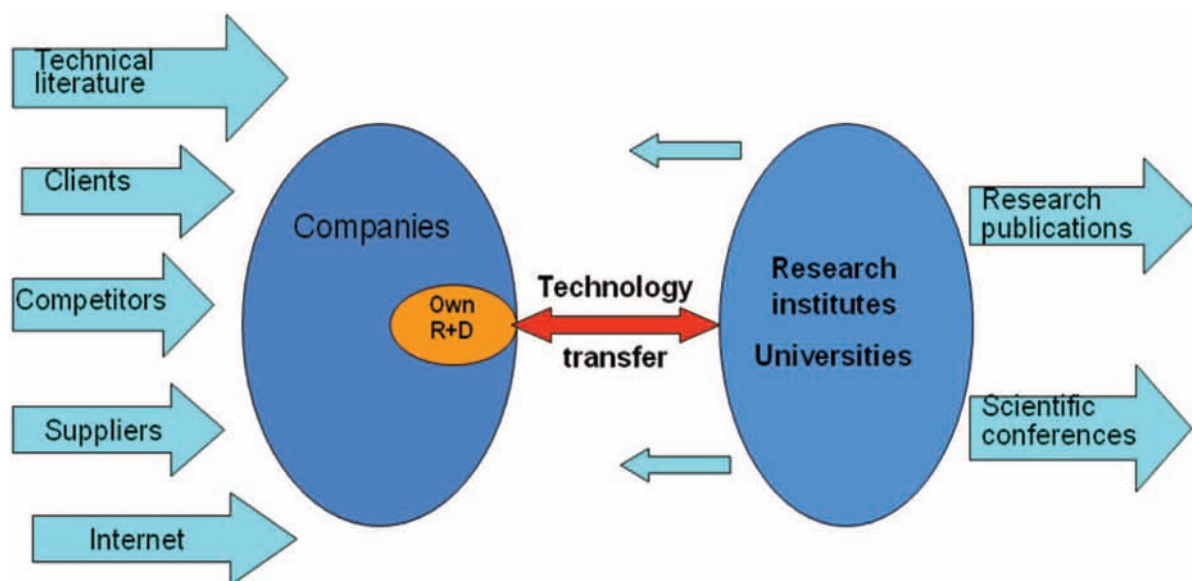


Figure 3b: Technology transfer - Technology push

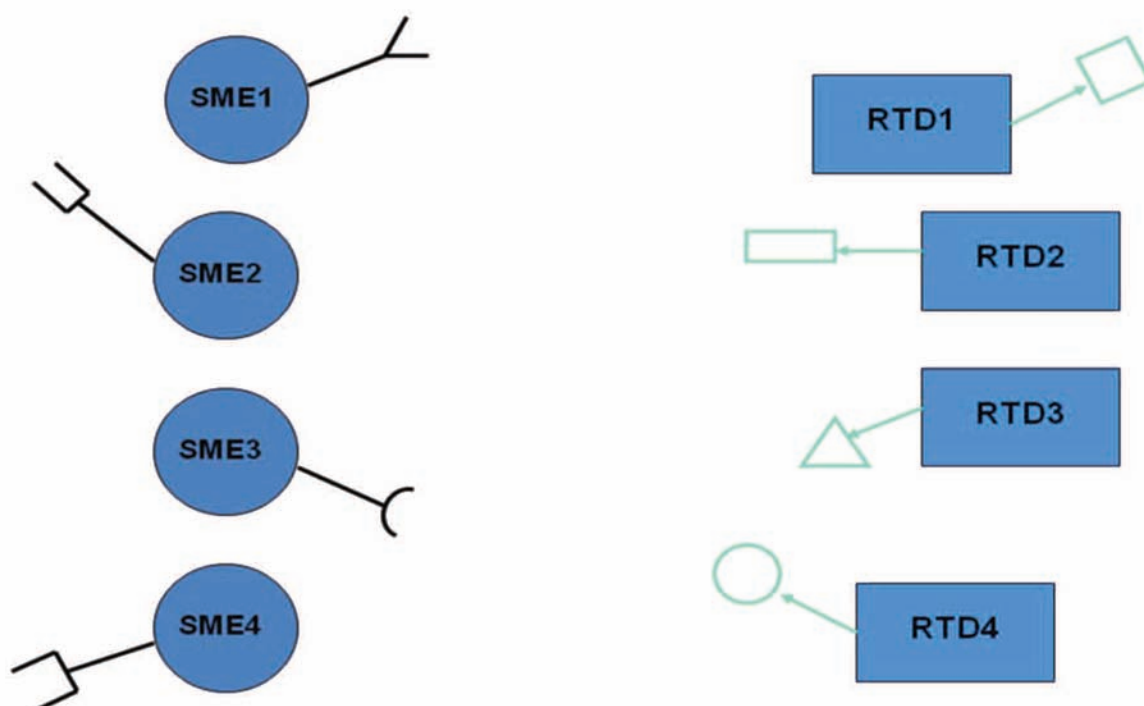


Figure 3c: Technology Transfer - Demand pull

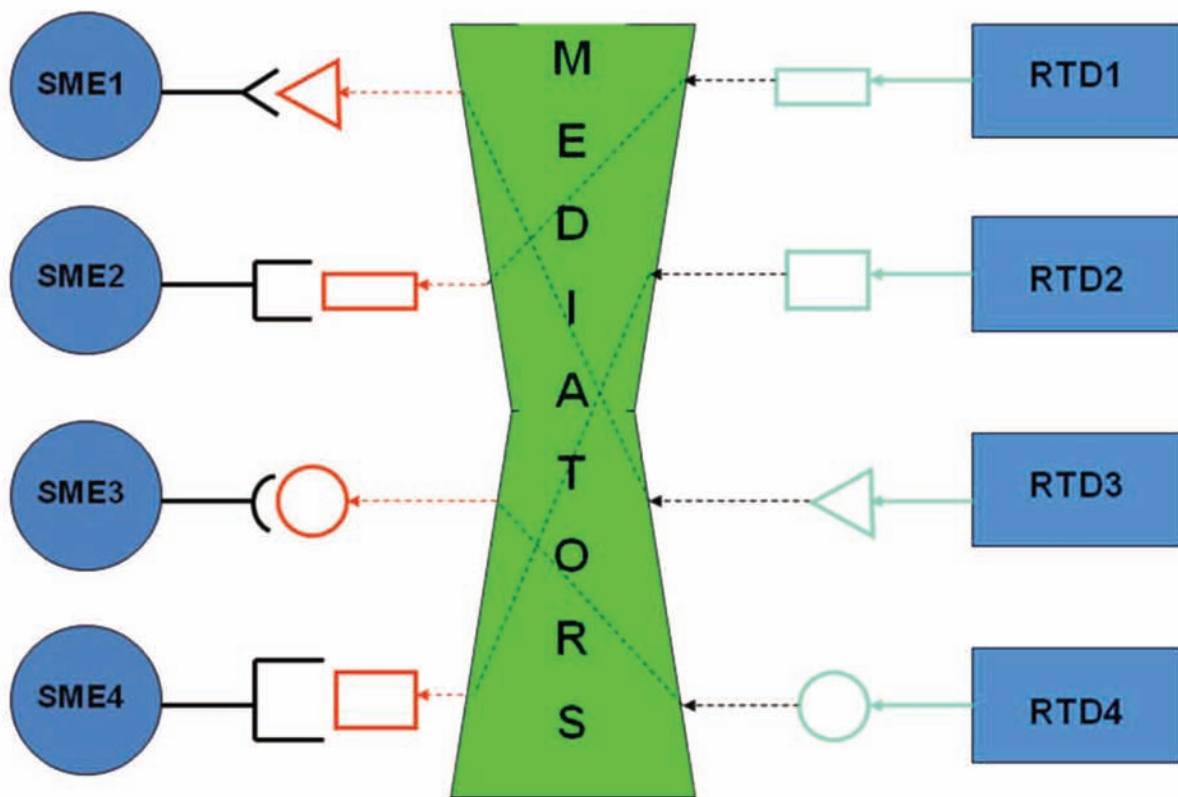
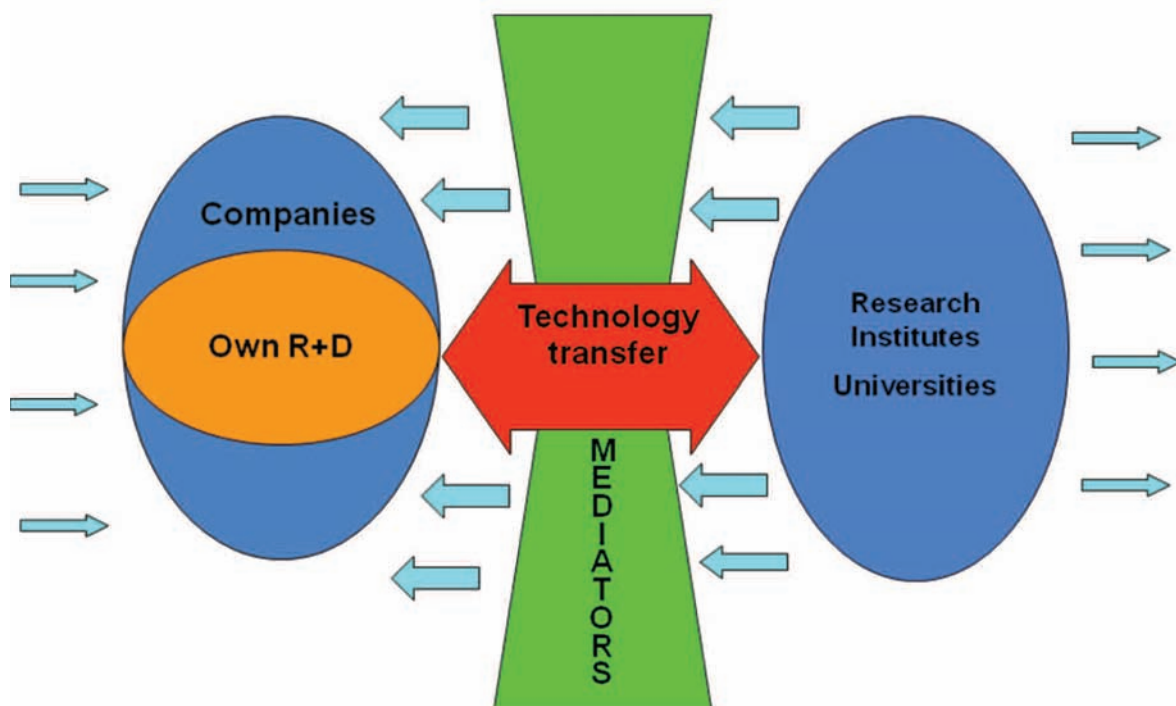



Figure 3d: The solution



Annex 3: Science and Technology Watch (STW) Newsletter of Flanders' FOOD (Belgium)



Annex 4: Structure of the INFO-SHEET of the TRUEFOOD project



WP-8 'Training, Dissemination and Technology Transfer'

INFO-SHEET on TRUEFOOD main research results

Prepared by

Needs / challenges:

Possible solutions / Improvements through research activities (WP and task):

Expected benefits / Impact of the results and possible application by SMEs:

Estimated resources / costs and time for applicability (if available):

Possible benefits for the consumers (if available):

Other relevant information related to this research result (if available):

Annex 5: Example of the Italian Truefood webpage (Federalimentare) dedicated to the newsletter

The image shows a screenshot of the website 'FEDERALIMENTARE', which is the 'Federazione Italiana dell'Industria Alimentare'. The website has a green header with the logo and name. Below the header is a navigation menu with links: Home page, Chi siamo, Associazioni, Documenti, Banche dati, Comunicati, FlashNews, and Formazi. The main content area is titled 'FORMAZIONE' and is divided into two columns. The left column is titled 'Truefood Area' and contains a vertical list of links: Home », Obiettivi », Partner », Attività », Eventi », and Contattaci ». Below this list are logos for the European Commission, CORDIS, and the Sixth Framework Programme. The right column is titled 'TDU newsletter' and features a grid of six food-related images with labels below them: 'Frutta & Verdura' (a basket of fruit), 'Pasta & Cereali' (a field of wheat), 'Olio' (olives on a branch), 'Tea & Caffè' (a cup of coffee), 'Latte & Formaggi' (a cow's face), and 'Bevande & Vino' (a glass of red wine).

Annex 6: Example of the Federalimentare newsletter



ITALIAN TRUEFOOD NEWSLETTER N°



TDU 15/08
Date and place

A) IMPORTANT EVENT FOR THE FOOD SECTOR
B) RESEARCH OBJECTIVES OF OUR PARTNER
C) WHAT ARE THE RESULTS OF OUR PARTNER?
D) WHAT ARE THE SCIENTIFIC RELEVANT NEWS?
E) WHAT YOUR TDU DO FOR THE SMB NETWORK?
F) INFORMATION AND TRAINING FOR SMEs

CONTACTS:

<p>Federica Scotto di Tella scottoditella@federalimentare.it</p>  <p>Alessandro Cordelli cordelli@federalimentare.it</p> 	<p>Federalimentare Viale Pasteur, 10 - 00144 - Roma Telefono: +39 06 5924317 Fax +39 06 5903342</p>
--	---

Annex 7: Template for a training assessment

EVALUATION QUESTIONNAIRE

Training Course on 'EU funding opportunities for SMEs'

Date and place of event: XXX

This evaluation aims to improve the quality of the course. Your opinion is very important. Please express your views on the following subjects by giving a score in answer to each question:

1 is "insufficient", 2 is "sufficient", 3 is "good", 4 is "very good", 5 is "excellent".

The questionnaire is anonymous. It is desired that all questions are answered. If you feel the need to add any personal remarks for the purpose of clarification, please do so.

1. To what extent have the aims of the course been fulfilled? Score: 1 2 3 4 5

Please comment if you feel that the aims or objectives have not been fulfilled:

.....

.....

.....

.....

.....

2. What do you think about the length of the course?

• too short

• appropriate

• too long

2.1. What, in your view, could be left out and what could be added?

.....

.....

.....

.....

.....

3. To what extent the following items have been addressed adequately and with clarity by the trainer?

Topic	Score				
EU support programmes for SMEs: An overview of the main funding opportunities available to European SMEs	1	2	3	4	5
How to apply to EU funding opportunities for SMEs: call for proposals and call for tenders - operational differences	1	2	3	4	5
Common elements to EC call for proposals: specifications, guidelines, application forms	1	2	3	4	5
Tips for writing a successful project proposal and setting up a project according to the EC objectives and requirements	1	2	3	4	5

Personal remarks:

.....

.....

.....

4. What do you think about the methodology used during the course?

Score: 1 2 3 4 5

4.1. Please give your opinion about the in-class exchange of views between the trainers and the participants:

Score: 1 2 3 4 5

4.2. Is there a balance between theoretical and practical topics / subjects?

Score: 1 2 3 4 5

Personal remarks:

.....
.....
.....
.....
.....
.....

5. What is your judgement about the quality of the training materials?

Score: 1 2 3 4 5

Personal remarks:

.....
.....
.....
.....

6. What is your judgement about the logistics of the course?

- Technical support Score: 1 2 3 4 5
- Lecture room Score: 1 2 3 4 5
- Coffee break Score: 1 2 3 4 5
- Lunch / dinner Score: 1 2 3 4 5
- Social activities Score: 1 2 3 4 5

Personal remarks:

.....
.....
.....
.....

7. Please give your opinion about the practical impact (benefits) and application of the information learnt:

Score: 1 2 3 4 5

Please comment if you feel that the topics learnt have no practical use or little practical use:

.....
.....
.....
.....
.....

7.1. Do you think that the benefits of the course are long term or sustainable?

Score: 1 2 3 4 5

Why? How?

.....
.....
.....
.....
.....

8. How much this course will contribute to the future work of your organization?

Score: 1 2 3 4 5

Why? How?

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

9. Please describe your most positive impressions and most negative impressions (difficulties/problems) of the course:

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

10. Please make any other comments:

.....
.....
.....
.....
.....
.....

Thank you very much for your cooperation! 😊

Annex 8: Example of an INFO-SHEET



INFO SHEETS WP 3 – Predictive modeling and risk assessment of traditional foods

INFO-SHEET on TRUEFOOD main research results

Predictive Modelling and Risk Assessment of Traditional Foods

Contact details:

Dr Fotini Salta, SPES TDU SEVT (fotsal@sevt.gr)
Prof G. Nychas, AUA (gjn@aua.gr)
Dr S. Panagou, AUA (stathispanagou@aua.gr)
Mr Istvan Pauer, SPES TDU FHFI (pauer@efosz.hu)
Dr Andras Sebok, Campden & Chorleywood Food Industry Development Institute Hungary Kht (a.sebok@campdenkht.com)
Mr Pedro Queiroz, SPES TDU FIPA (pedro.queiroz@fipa.pt)
Prof Tim Hogg, ESB (tahogg@esb.ucp.pt)
Dr D. Thuault, ADRIA (dominique.thuault@adria.tm.fr)
Dr F. Postollec, ADRIA (florence.postollec@adria.tm.fr)

Needs / challenges:

At the level of the industry, many decisions concerning microbial food safety have to be made within a limited time-frame and need to be based on the best use of complex and fragmented available information. This means that industry must have the tools and knowledge to decide and to be responsible for decisions regarding food safety. There is need for simple, quick decision support techniques. These techniques have to be based on structuring the available information using microbiological risk assessment in a simplified form, supported by predictive modeling. This way SMEs can identify the priority issues for a specific traditional product. Mapping the food chain of traditional food products with a quantitative approach allows better management of the safety of these products.

Possible solutions / Improvements through research activities:

A microbial database has been developed with 548 datasheets on traditional European food products (fermented meats, dairy and plant products) to quantify the presence/absence of food-borne pathogens and the results have been introduced in a prevalence database to facilitate use by the industry.

- Huge variations in the mapped food supply chains (smoked sausages, ham, cheese, yoghurt, green olives, beer) in terms of time-temperature, chemical composition of the products and determination of critical control points have become available.
- An industrial risk profiling information system has been developed based on a simple questionnaire that contains the elements of risk assessment to be employed by the industry.
- Predictive modeling can provide significant help to estimate safe food shelf-life relatively quickly and cost effectively through a procedure that has been developed for the industry.
- Data generated in TRUEFOOD are being used for improving the accuracy and reliability of already existing models.

Expected benefits/Impact of the results and possible uses for food producers:

- The amount of quantitative data will be made accessible to the food industry by means of user friendly software that will allow the development of practical safety management decision tools.
- The outcome of modeling work will result in the improvement (if necessary) of already existing software packages (e.g. Combase, Sym'Previous) that are already available in the internet.
- Concerning risk assessment, a simple risk profiling sheet has been developed that can be adapted directly by the industry. The user will have to provide the information for risk analysis in the form of qualitative statements and/or quantitative data concerning factors that will affect the food safety risk to a specific population, arising from a specific food product or hazard, during the steps from processing to consumption. Risk profiling provides a relatively simple practical tool for structuring fragmented data available at company level to significantly improve the reliability of the evaluations on safety of the products.

Annex 9: Example of the French INFO-SHEET



Les consommateurs n'acceptent pas toutes les innovations dans les produits traditionnels

Vous êtes un producteur de produits alimentaires traditionnels ? Vous souhaitez innover ? Il est intéressant de savoir quelles innovations sont tolérées par les consommateurs et quelles nouveautés sont moins bien acceptées.

Qu'est-ce qu'un produit traditionnel pour le consommateur ?

Pour les consommateurs interrogés dans le cadre du projet Truefood les produits traditionnels se caractérisent ainsi :

- souvent consommé ou associé à des événements et / ou des saisons particulières,
- transmis d'une génération à l'autre,
- fabriqué d'une manière spécifique en accord avec le patrimoine gastronomique,
- identifié et connu pour ses propriétés sensorielles,
- associé à une certaine région ou à un certain pays.

Les innovations dans les produits traditionnels qui sont les mieux acceptées par le consommateur : (par ordre d'importance)

1. Utilisation de labels qui garantissent l'origine de la matière première
2. Sélection de matières premières biologiques ("bio")
3. Nouveaux procédés qui augmentent la sécurité
4. Réduction de la teneur en matières grasses
5. Innovation au niveau de l'emballage (ex ; emballages refermables) tout en maintenant la qualité sensorielle du produit
6. Assortiment plus grand avec plus de variétés
7. Possibilité d'acheter le produit directement chez le producteur

Les innovations qui sont les moins bien acceptées par le consommateur : (par ordre d'importance)

1. Possibilité d'acheter le produit via un distributeur automatique
2. Nouvelle combinaison d'ingrédients
3. Préparations alimentaires précuites
4. Diversification de la forme et/ou de la texture

Source:

Ces résultats sont fournis par le projet européen [TRUEFOOD](#).

Pour plus d'informations fgorga@ania.net ou www.recherche-ania.net

