



Agribusiness growth Emerging skills and interdisciplinary development of integrated training courses

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Rationale

This document is the first of four planned outputs of "Food for Growth" (Project N° 2015-1-IT01-KA202-004763 Cup queues G86G15000500006), Erasmus + project whose aims are to strengthen the Strategic Partnership for Vocational Education Training.

In the first phase of the F4G Project, activities focus on the **analysis of training needs** related to the framework of opportunities and criticalities for the development of integrated planning and communication paths.

Purpose of the Report is to frame the emerging skills of the quality technician of the agro-food process and to identify the skills in innovation and communication that enable the role of the quality technician of the agro-food process to facilitate the process of transfer of innovation. Moreover, the aim is also to facilitate the dialogue of the company to convey the innovation value in enterprise communication systems, to contribute to the transparency of innovation of business processes as a choice of sustainable productivity.

The report returns the results of the training needs made through desk and on field research. The survey was conducted from December 2015 to March 2016 and the results will help to guide the development of training courses related to innovation communication.

The structure adopted across the Report is explained as follows:

- This chapter, leads directly to the Chapter 2 "Emerging skills in Communication to empower innovation practices" which represents the main outcome of this Report providing in depth evidence about the analysis of the results of the need analysis carried out in the project. With particular emphasis on the identification of the set of integrated emerging skill needed in "communication of innovation" requested for food technician in order to strengthen his key role in facilitating market and social acceptability of innovation product and process.

The Research material is integral part of this Report and it's represented by 3 in depth analysis, realized by the F4G project team researchers and focused on:

- Main trend on growth of the agro food sector and the role of innovation
- Communication as a tool to support innovation process
- F4G Methodology

CHAPTER 1; A unifying concept for innovation in food: the Food Chain Management (MC)

1. Introducing the notion of Food Chain Management

Innovation in the food sector is rarely a breakthrough innovation obtained by means of deep, vertical oriented R&D activities aimed at radical change. Process and product innovation is not only incremental but is frequently collective. This means that companies use extensively technical solutions learned by practice and examples. As said, innovation in the food sector derives from relationships linking the individual actors in bonds which are expression of the organizational capabilities of the sector. As innovation in the food sector is, as said, both incremental and radical, the aspects associated to the appropriate deployment of innovation factors is a key element to success.

In fact, companies in the food sector rarely adopt innovations totally developed in house. By contrast, they normally rely on organizational networks providing resources and facilities to the objective of making innovation accessible. Compared to other sectors, the food economy needs horizontal collaborations and communal resources helping the companies to develop their own specific innovations.

In this context, the notion of Food Chain Management represents a key concept to elaborate the way innovation enter the genuine innovative capacity of companies. It is essentially made of a network of relations contributing to the establishment of an effective innovation policy. The interactions of the members of the food chain constrain and determine the overall capacity of the food chain members to act as innovative subjects. This is transferred into a web of relationships in which ideas, projects and practices are made accessible to users. Such a model is clearly inspired by a theory of horizontal innovation, i.e. one in which institutional facilities (knowledge repositories, shared knowledge, communal labs, etc.) are as important as economical constraints (formal investment in R&D, competitive knowledge, cost effectiveness, patents, etc.).

In particular, the SMEs of the countries involved in this ERASMUS+ project are culturally and technically integrated in networks which already make innovation coherently within a food chain approach. Companies, especially SMEs, belong to systems of relations, either in the form of B2B deliveries, typically when smaller or specialized companies provide semi-finished products to larger companies, or in the form of collaborative networks, based on less hierarchized relations. The latter ones are especially important to protect and enhance innovative procedures. They allow a relatively easy access to technical information and experimental opportunities, allowing a diffusion in solutions that might be of general interest to food manufacturers.

2. Using the food chain management to enhance the innovative performance of food companies

The Food Chain Management concept can be a major factor in making food innovation more accessible and widespread. In short, food chains (FCs) are tools to originate and preserve and diffuse innovation opportunities. In fact:

- ➔ FCs maintain an essential connection with the final consumers, so allowing companies to scout consumers' preferences and to invest in innovative practices that are in line with what the market is ready to understand
- → FCs help to establish long term commitments by companies to structural objectives of the food economy, specifically the engagement to a constant safe and high quality food production and the commitment to sustainable and eco friendly food manufacturing practices;
- → FCs help to maintain an acceptable level of investment in innovative practices, by supporting the whole chain, including the weakest links, with technical and economical resources and with research and development opportunities, especially in the form of sharing of knowledge and communal know-how;
- → FCs steer the food companies in their competitive paths, most specifically by favouring adaptations of each company in the struggle for access to markets at favourable conditions. This is mostly achieved by guaranteeing, through institutional-based resources, active programmes devoted to the workforce and the diffusion of scientific support to R&D departments at company level;
- → FCs support flexible and efficient infrastructures that can be communally used by companies to test their own innovative solutions in the form of technical and practical experiences exchange: significantly by linking larger companies with smaller ones;
- → FCs help coordinating the communication among companies hence providing dedicated channels to discussion of aspects concerning innovations and favouring meeting points among company personnel which in turn stimulate the transmission of an innovative mentality within companies;
- → FCs allow the interactions of complementary disciplines in order to facilitate the adoption of newly tested solutions along unexplored paths;
- ➔ FCs create the conditions for an effective technology transfer and innovative training methods.

These features describe, even if briefly, some of the fundamental aspects of the strength of the organizational networks constituting the appropriate environment for an active promotion of innovative practices. In light of that, it is decisive to link the system of opportunities associated to innovation with the equally important topic of reinforcing the professional profiles of those working in the food industry.

3. Examples of innovative companies professional profiles designed specifically for SMEs (MC)

Trend analysis activities rely heavily on a collaborative environment within the company, where different skills and capabilities find a way to the effective process of innovation. This crucially involves the attitude of company workers to test their own culture in collaboration with colleagues. Food processing requires, in fact, the functioning at the same time of different capacities. Besides, the appreciation of the consumer has always a leading role. Pleasure and taste, in sharp contrast with other sectors, as for instance the pharmaceuticals, are essential features of what we eat and drink and therefore it is no surprise that innovating in this area is something very critical.

The role of the workforce must be accounted in connection with the delicate aspect of training skills and training methods. Supporting innovation is often a matter of preparing personnel to manage unprecedented situations. This is linked with a variety of competences that are partly derived from experience but partly can be learned through a highly calibrated training format. These aspects are the content of the present paragraph.

4. Training practices for a significant impact on food innovation

Training means operating at the level of the human factor. Good training empowers clever people by moving static intelligence towards dynamic problem solving. In such a context, it is important to choose not only adequate skills, which is the traditional task of adequate training, but also the best enforcement of the personnel in in the workplace.

Training has evidently its natural expression at the level of the teaching and learning experience. In this connection, the traditional school-based technique of producing learning outcomes by means of long dedicated training, normally in the form of gradual planned course whose duration depends on the complexity of the expected results, associated with formal academic training cannot be substituted. This level of training maintains its rationale in toto. Modern, evidence-based training methods rely heavily on the diversity of resources made available by the new digital technologies. This adds enormous potential to traditional training and teaching methods, especially when practical, real life applications of the learned contents should be demonstrated to the students. This approach maintains its perennial validity and constitutes the base on which to build improvements and gradual learning complexity. At this level of knowledge all those employed in the food sector, and even more when working in contact with innovation, should be exposed. The capacities generated here are those which define minimally the skills of an employee and are normally used to assign basic tasks and mansions.

A second step towards putting in real value the activity of training for workforce is more centred on those aspects of learning relating to developing real innovative skills out of the existing basic education in one field. This objective involves a creative framework and a continuous exchange of views and routines with expert labourers. It therefore includes training formats and exercises which get beyond the conventional ability to carry out a task, even a complex one, in a proficient way. Overreaching the level of conventional professionalism is a difficult objective but it is essential to spread the innovative mentality in a company. This level of active professional engagement can be obtained through a long and dedicated work in association with highly competent workers and within an organized working environment. The skills developed out of this effort challenge the normal outline of what a "job" is: they include certain abilities and quality of the performance of a work which clearly exhibit differences attributable to the specific skills of a worker, to its varying degree of experience and personal creativity. These traits are well known and constitute the basis to assign responsibilities and directive roles in a learning based company.

But there is a third level, which is rarely mentioned, in connection with the discourse of training and job organization. It refers to the dimension of "lateral thinking", i.e. the ability to carry out successfully a job (or a job-related task) in an unconventional and possibly also unexpected way. This goes beyond being professionally proficient. It takes into account an original way of looking at the task, it puts together elements of problem solving which are highly personal and frequently not included in the conventional "manuals" associated with the ordinary elaboration of a task. These abilities are partly associated with personal talents but partly can be considered as subject for active learning. Moreover they are not only property of the single but are extended to include the business environment and this is the wealth of an organization. They can be defined as "high performing skills". This third, critical, level of training is obviously linked to higher educational objectives and requires specific methods.

5. Articulating the teaching and learning environment of an efficient innovation in the food sector

In order to achieve a harmonized target in terms of developing innovative businesses with a motivated and open minded workforce, training profiles and training resources in the company should ideally reflect the threefold articulation described above.

The food innovative company must be by itself a learning environment. Innovation is not something that the company buys at the store (although obviously many ingredients of innovation, like, for instance enabling technologies, can be purchased); what is really important is a structure conveying the needs of the company. This turn depends on a clear vision of the aims of the innovative enterprise.

In light of this, institutions and stakeholders have a responsibility of enhancing training organizational models capable of mixing robust training and flexibility. Having in mind the three levels of training provision described, an innovative food company could ground its innovative capacities along the following lines:

a) technical skills

Technical skills are summarized by those job descriptions that are common in defining the basics of the process and product innovation competences. Therefore they are focused on the detailed mansions specifying the day by day practice of food manufacturing, and technical improvements. On this basis, technical skills are the backbone of the food innovation processes. Any innovation presupposes as a background highly skilled food technicians teams.

Examples of technical skills

The paramount case of technical skill is the one represented by the specialty of food technician. A food technician is expected to know and manage all the phases of a specific food manufacturing process in the "from farm to fork" logic. Hence the technician will be able to manage all the main aspects which characterize the nature of ingredients, the nutritional power of assembled food and the properties (like texture and taste) which are essential to determine the consumers' preferences.

As they are experts in food technology, food technicians make sure food products are produced safely, legally and are of the quality claimed. They can be involved in developing the manufacturing processes and recipes of food and drink products. On request, they may work on existing and newly discovered ingredients to invent new recipes and concepts. Food technicians are normally the main interlocutors in food design projects and programs and are the profile in charge of developing new test products. They interact with expert in both primary sector (agriculture) and retail and have a say in the definition of consumer preferences. They are well trained also in food legislation and know how to interact technically with legislative requirements concerning food matrices.

b) creative skills

The term "creative skills" means, somehow, an upward development of the main skills that characterize the profile of the food technician. Once agreed that the core capacity of the technician is focused on manufacturing food and drink according to certain requirements, a food manufacturing innovative environment will need highly motivated people wanting to go "beyond the standard work performance". The difference is not in formal training and skills, but rather in complexity and extension of the professional task. A creative food technician has an excellent specific technological profile but has in addition the talent for continuous improvements and ameliorations in various aspect of the production line. She/he will constantly question the existing procedures and check the feasibility of new solutions, working on testing and experimenting. Being proficient in evaluation and steering projects, she/he can decide whether to pursue an idea or to abandon it. Devised solutions are checked with colleagues and market test with consumers are initiated.

Examples of creative skills

An experienced and bright food technician will act in contact with all the departments and internal functions in the company, securing the optimal technical support to sales and marketing. She/he will also interact with the consumers – maybe via consumers associations, forum and blogs, providing updated and clear information to all those interested in better understanding of the features of the product, including its nutritional value and health related profiles. A creative technician will systematically liaise with current scientific research in the relevant fields and will be able to propose research areas and joint projects. Moreover, she/he will link with those experts in the social sciences exploring underlying determinants of consumers' preference in different contexts and cultures. She/he will not forget the contribution of neurosciences to consumers' decision patterns. A creative technician will be sensitive to novel foods and will talk to experts in the sector of policy and regulatory affairs to provide reasons for effective negotiations with policy makers.

c) high performing skills

High performing skills are difficult to define. They have more to do with results, i.e. outputs, rather than inputs. High performing skills are selected in the field, through a long process of learning and competition. Hence the emphasis should be not on mansions but rather on the way an activity is carried out.

Examples of high performing skills

A highly performing food technician is a top quality human resource operating at the highest levels of responsibility. She/he will constantly report to the top management of the company and will be systematically involved in defining the appropriate technological strategy of the firm. Being the senior responsible for the innovation department, she/he will be crucially present in the decision making process concerning the product and project strategy of the firm. In this role she/he will operate to design the new and novel product and to present the consumers with nutritional and health claims of the company. She/he will cooperate in designing the negotiation with public bodies concerning new regulations and standards and shall steer the media relation policy of the food company, providing reporters and journalists with the right message.

CHAPTER 2: Emerging skills in Communication to empower innovation practices

1. Innovation and Communication: why a new training

The training model of experimental nature aimed at the development of skills in communication of innovation will be the deliverable of the "Food for Growth" Project, designed to meet the need to update the framework of competences of the technician and technologist figures of the food processes compared to the transformation of the industry innovation processes.

Starting from the considerations elaborated in Chapter 1, with particular reference to the specificities of the open innovation processes in the Food Chain and the competencies kit identified in support of the food technician and technologist - the section intends to focus in particular on the development/identification/ characteristics of **communication of innovation skills (so-called emerging skills)** emerged in the analysis of the requirements under the first phase of the F4G Project.

Particularly in the early months of the F4G project, a survey on needs of SMEs and the education sector in the Agro Food industry (the "Methodology" section of the document provides further details on the targets and aims of the research) was conducted to guide and intercept emerging areas of action of the professionals engaged in various areas of the innovation process, and detect corporate communication practices functional to the emergence of innovation, to enhance the investments made and to manage the reactions of the market towards the innovation itself.

Beside the communication activity generated by the company and addressed to the stakeholders of the production and consumption chain, the methodological structure of F4G looks to the growing consumer role in defining successful innovation and aims to strengthen the capacity of the company and professional profiles, engaged in innovation processes, to detect the interest of the consumer and to anticipate the acceptability of innovation, to optimize R & D resources and finalize them to a success in the market.

To this end, the F4G project moves towards the goal of identifying areas of emerging skills and develop a functional experimental training program to actualize the ability to "communicate innovation" by technical profiles employed in the company. The communication of innovation that the technical profiles help to realize is oriented:

- To support awareness for innovation contained in the SMEs productions,
- To expand the technical knowledge for decision-making of consumers,
- To strengthen the "consumer engagement" in guiding the process of business innovation

The aspects listed here since can be synthesized in the purpose to facilitate the acceptability of agro-food innovation by the consumer. That objective, shared by all major European organizations for the development of the agro-food sector, is consistent with an emerging paradigm of the industry innovation process characterized by:

→ fragmentation of innovation interventions: the sector, historically defined "a scale-intensive"¹ one and with a low rate of return on investment in R & D², is represented in Europe especially by SMEs,

¹ Pavitt, K. (1984). "Sectoral Patterns of Technical Change: Towards a Taxonomy and a Theory". Research Policy, 13, 343-373.

 $^{^2}$ The rate of return on investments in the food industry is in the last places among all manufacturing sectors. Globally, the OECD registered the intensity of the food industry research which attained about 0.3%, while the pharmaceutical sector recorded 11% and the average of the manufacturing industry is 2.4%.

with a low structured orientation to innovation in terms of the presence of internal departments and expense recorded in R & D. As noted above (Chapter 1), innovations, often incremental, are related to new processes and products for the enterprise, and in recent years the factors that lead to innovation have consolidated: from the boost to achieve high quality standards, supported also by the effect of the current legislation, to research and selection of raw materials, innovation in production methods, food processing and commercial solutions including portioning, packaging, etc. Product or process innovation implies a diversified and simultaneous intervention of several areas of activities to align production scenarios to consumer trends constantly changing and growing, but not always underlies unit enhancement logics (which are not always obvious) of the innovation reached.

Decision-making centres of the innovation process and innovation orientation to consumer demand are fragmented: although implied and implicit in the production systems of primary consumer goods, innovation is not always made explicit and shared with consumer systems. It should also be assumed the axiom that the consumer demand is just as diverse, contradictory, plural towards the healthy, economic and pleasure choices, sustainability and authenticity of the products. In this context, the fragmentation of intervention areas of innovation and of the impacts on consumer trends does not facilitate the SMEs and the technician and technologist, to interpret a functional synthesis to respond to the interests represented by the various parties of the production chain. On the other hand, the fragmentation of the interventions of innovation in the different steps of the production process may not have adequate visibility in the eyes of the consumer, debasing the value of the investments made by SMEs. This element, i.e. the **fragmentation of innovation interventions**, is likely to generate a dispersion of know-how in the supply chain and not to be rewarded by consumption and buying behaviour. It shows the need to know how to value the effort of SMEs in innovation from the consumer's point of view and, in both directions, to detect the consumer's needs (wants and needs) that would impact on the development of innovation.

A first effect of the transformation of the research and innovation paradigm in the food sector coincides with the need to strengthen, identify and return the meaning of the innovative interventions on the processes and products of the sector in response to the consumer needs and demands. To approach, therefore, the innovation to the common interest of production and consumption in order to facilitate acceptability. A further emerging feature of innovation paradigm, in which the technical profiles within the company operate, is the:

→ multiplicity of interests that drive innovation compared to the purpose of improving products already existing (line-extension), of developing new products (new brands), whether they are guided by purely imitative logic (me-too) or by new product identification. We are witnessing what has been described as a kind of widespread innovation, an "innovative ferment" that pervades the production and marketing systems, drawing a kind of incremental innovation and not necessarily linked to the intrinsic quality of the product but only to its presentation, logistics, conservation, methods of use and preparation, format, etc.

ANALYSIS OF BUYERS RESULTS (ANALYSIS CARRIED OUT BY ADMINISTERING QUESTIONNAIRES TO SMES AND THE EDUCATION SYSTEM OF AGRO-FOOD SECTOR)

The target of surveyed SMEs confirms the presence in the company of a R & D area in the SMEs of the sector or, failing that, the presence of stable partnerships between business and local research institutions. SMEs' investments in terms of resources employed in the industry and innovations introduced confirm the prevailing areas of interest related to product design, reformulation of recipes and food preparation in addition to the innovations introduced in the manufacturing process. Poor is the propensity to use and introduce ICT, marketing and advertising, raw materials and new ingredients. They focus, therefore, on innovation interventions aimed at several aspects, for the most technical, of the production.

3. Does your company have an R&D department?



Possible answers:

o Yes

o No

o No, but we constantly collaborate with: (specify, for example supplier, Public bodies, Universities, regional Local innovation agencies, etc.)

o No, but we occasionally collaborate with (specify, for example supplier, Public bodies, Universities, regional Local innovation agencies, etc.)

o Other (please, specify)





Possible answers:

o Major product

o Product improvement

o Major process

[]

o Process improvement

o Major organization

o Other (please, specify)

6. Does your company own patent(s)?



Yes, 1	55.6%
Yes, 2 - 5	33.3%
Yes, 6 - 10	11.1%
Yes, more than 10	0%

Recourse to product innovation to better respond to market trends is largely confirmed by the companies target coming from the countries involved in the F4G Project.

The attention to the nutritional value of the product, if necessary also by reformulating the recipe, is a further confirmation of an innovative process primarily aimed at improving the capacity of the production response to a request for emancipated market, paying attention to proper nutrition and the ability of product to convey symbolic and cultural value of the food.

Meeting market demands and supporting the consumer trend is the primary objective of the innovation system toward which operates the company, interested in the creation of new markets with, or even through, the improvement of quality, productivity and production cost containment.

7. More specifically, which are the areas where your company innovate most (max 3):?



Possible answers:

Raw materials; New ingredients; Refit/reformulation of recipes, food preparations; **Product design**; Manufacturing process; Nutritional profiles; Sensorial properties; Organization; Packaging; Logistics; Retailing; ICT; Marketing and Advertising; Energy savings/ resources efficiency; Other (specify)......

9. Which are the main aims of the innovation activities of your company? (max 3)



Possible answers:

Costs reduction; Increasing efficiency /productivity; Satisfy the requests of the market/consumers trends; Satisfy requests of the retailers; Creation of new market/s; Improving existing markets position; Satisfy law requests; Increase profits; Improve quality; Ameliorate food safety; Reduction of inputs; Energy reduction; Improvements concerning environmental sustainability; Ensure compliance with existing /new regulations; Raise the standards with respect to Ehical issues (welfare, CSR etc); Other (specify)

On the side of the institutions responsible for training of the Technician and Technologist profiles of food processes, there is the parallel widening of the offer of training to strengthen skills related to SME innovation processes. In terms of training offer, the courses relating to specific production techniques (Dry Ice Blasting, Sustainable development, etc.) recorded the highest rate in the last 2 years in the surveyed institutions in Spain, France and Italy.





The results of the survey reflect the engagement of SMEs in focusing innovation in production methods and characteristics of the product, while innovation of Marketing & Advertising systems remains not relevant.

The partiality of the communication systems, internal and external, also impacts on the detection systems of consumer preferences with respect to the evolution of innovation processes.

The involvement of the consumer appears late, with respect to the innovation design process, and not direct, being involved experts external to SMEs that, in most cases, coincide with the experts of the Food products distribution systems. Although they are strategic profiles to share the results of the sales and the impact of the product "innovated" with respect to consumer trends made, it is desirable to involve the consumer with greater determination in different types (individual, group, organization of interests) so that the team of the SMEs involved in the development of innovation can anticipate reactions of the consumer not only to the innovated product but also with respect to technology, ingredients, manufacturing processes and identify potential weaknesses of the proposal.

This consideration is divergent with respect to the growing underlying consumer demand to complement the choice of purchase with different items of interest: the healthy value of the choice, convenience, satisfaction of sense - pleasure, sustainability and authenticity understood as product traceability. The growing consumer awareness of the tangible values and services related to the product generates a demand for knowledge that, in most of the work of SMEs, does not immediately translate in ad hoc services. In this multiplicity of areas of intervention and interest, intercepting and processing priorities and preferences of the customer to drive the innovation process become a driving force for SMEs, with needs to improve investment efficiency and the costs of innovation development to strengthen probability of success in terms of acceptability and innovation responsiveness to market demands.

2. How does the company receives and integrates consumers' priorities and preferences in the innovation process?

The results of the survey confirm the greater use of indirect means of detection of the consumer preferences abut the product, it is not considered relevant to involve the consumer in the innovation of the production process, but is more involved in the case of product innovation.

The methods more frequently used by SMEs for the detection of the consumers' priorities and preferences is anchored to tools mostly indirect, starting from data collected from the sales and corporate sales departments and then accessing to market surveys on the sector and on the area, taking into account analysis of competitors and the impact of other economic factors. Parallel, the use of direct instruments governed by business social media starts, for example through social networks campaigns sponsored by the company.



3. How are the consumers' priorities and preferences in product R & D practices recognized and integrated?

The two priority responses outline the figure of experts external to SMEs, category that includes a variety of profiles for the most part coinciding with parties in the distribution chain (suppliers), and the development of pre-series products to test on the market. The lack of direct relationships with consumers (see the low use of communication dedicated to expert consumers, including consumer associations) and their involvement in advanced stages of choice and innovation finalization (pre-series test) points out the fragmentation with which to date, SMEs detect and process consumers' interests in the process of innovation design.



Possible answers:

Through acquired external expertise; Through an experimental product line; By developing Pre-series models to be tested on the market; Dedicated communication to expert consumers (blogs, users communities, etc.); Through Internal awareness actions aimed at involving R&D personnel; Through external partnerships / common projects with other companies; Through partnerships in R&D projects involving research and university experts; Other (specify).....

From the point of view of education and training institutions, there is almost unanimous consensus to take action to improve the dialogue and communication skills of the food processes technician and technologist figures with suppliers, dealers, communication agencies in charge to develop the advertising campaigns of products towards end consumers.

With respect to the responsibilities of food technicians involved in innovation processes, do you think is important to improve the skills for dialogue and communication with suppliers, retailers, advertising agencies, consumer organizations in order to improve the innovative effort of the company?



The idea of improving the SMEs communication practices towards consumers, designed to increase the market appreciation of the innovative ability is aimed at raising the profile of the innovations introduced in the final products and at encouraging, through new product design methods, the production and the creation of value.



To anticipate the acceptability of innovation by involving the end user in the solution design process and integrated answers to major items of purchase interest is a major focus into which insert different applied research experiences in Europe, which support the F4G Project to create a common reference framework for the sector's development. Among the most recent initiatives undertaken under the 7th Framework Programme for Research and Technological Development, the RECAPT Project, for example, helps to bring out the future of the agro-food innovation, traditionally made by the industry supported by the Food Science industry, to a process including suppliers and dealers but also restaurant owners and other profiles which represent an important "bridge" between demand and consumer needs and producers, agro-food researchers involved in the development of product and process of innovative products result in the ability to anticipate innovation acceptability. The innovation model that is being configured is comparable, for some sections, to an Open Innovation model, or, as we have previously seen, a pattern which underlies the opening of the innovation process (or some stages of it) to all active players so that knowledge can circulate more freely and be turned into products and services to create new markets, promote a culture of entrepreneurship more receptive of the external environment.

Food Technology Acceptance - RECAPT FP7 Project - 289755

The project supports the development of a platform «CFIF - Collaborative Food Innovation Forum », to convey and support the exchange of data and information in order to facilitate cooperation between agricultural and food scientists, industry, restaurateurs and retailers in the sector. The project is based on the idea of an intervention model which eases the Acceptability of Food Technologies acting on three areas:

- 1. Acting directly on the consumer and on his willingness/ability to accept new products, or rather on the knowledge of emerging technologies
- 2. Strengthening the role that retailers and restaurateurs can support in conveying the content of innovation technologies
- 3. Evolving the management systems of the innovation process toward Collaborative Innovation Management systems.

For more details: http://cordis.europa.eu/project/rcn/101335 en.html

It's useful for some topics of F4G because...

The design experience is a useful reference for the purposes of F4G to the extent that:

- Confirms the extension of the range of stakeholders involved in the communication of innovation process, including "hinge" role between production, processing and food sales, able to communicate and incorporate feedback from customers about products. The profile of the restaurant owners is one of the emerging profiles.
- Identifies the anticipation of the acceptability of innovation as a strategic element on which to build new relational models between industry and market, to put in contact the interests of production and consumption.

These priorities stimulate the SMEs' technician/technologist capacity to provide specialized, technical and scientific information, through rapid sharing tools, aimed at a different target, providing the ability to take and process the contributions of the various stakeholders in the innovation process.

In the food industry there is a never-ending succession of experiences of Open Innovation platforms, such as "Social Roots - Open Innovation in Agro-food"³, programs for the screening of ideas for the development of agro-food innovation coming from a target of unlimited stakeholders, participating in the construction of the innovation idea. The creators consider the program as a key to the paradigm shift in the innovation system that goes beyond the linear approach of past years, heavily dependent on research bodies, adopting interactive models based on the involvement of all actors of the innovation chain, starting from the needs of end-operators, be they companies or citizens / consumers. "It is therefore necessary to build a new innovation systemic supply chain based on a bottom-up approach that focuses on listening to the needs and the relationships between the actors. Relations, networking, both in terms of extended supply chain including also institutions and policies and at the innovation team level, are placed as a quality element for the development and success of a new idea; a concept of social capital, not just limited to economic and financial aspects, but expression of all enduring relational resources that a social actor (individual, group, etc.) can use, along with other resources, to pursue their own goals for social innovation".

This consideration introduces a further peculiarity that the innovation process in the sector assumes, namely:

→ the inter-disciplinary and multi-actor dimension of research systems and agro-food innovation, aimed at generating a collaborative and integrative tissue of search functions (public and private research institutions), guidance and system governance (government agencies and industry)

³ The program is supported by the Ministry of Agriculture, Food and Forestry (MIPAAF) and coordinated by the Fondazione Giacomo Brodolini in Italy.

representatives involved in the consultation systems), innovation financial support (credit institutions, investment agencies of local authorities) oriented to market success.

The plurality of actors and interests involved in the design and identification process of innovative solutions for products and processes in the food industry, makes functional the skills in communication by the involved technical profiles to catch and process the priorities and interests of different stakeholders and to drive innovation to improve the acceptability, a driving force for SMEs with needs to improve investment efficiency and the costs of the development of innovation and to strengthen probability of success of the innovation in the market.

Starting from the typical features of innovation process in the food sector, the F4G Project collects and raises an interest in intercepting the **role of the consumer** as an emerging role in systems of guidance and selection of innovation content, complementing other economic, supply chain, market development variables.

The consumer duly informed of the principles of innovation, is a stakeholder that enters the system of **innovative technological solutions** sharing, from the production chain to the consumer, to anticipate the acceptability of innovation in the market, based on innovation criteria shared with production process and consumption system.

So, a profile of "critical consumers" emerges in the purchasing practices, with an orientation to the analysis and evaluation of the quality of the agribusiness product/process more or less scientifically consolidated, which seeks to raise awareness of her/his consumption choices and strengthen practices of virtuous purchase, with capacity to formulate a demand for more and more elaborate for nutritional and health demand (intolerances, allergies, attention to food quality and traceability of the production and transformation processes, etc.), ethics (veganism, vegetarianism, health consciousness, etc.), economic and cultural needs. This is the type of customer/consumer whose buying behaviour and choice orientation can be interpreted and/or supported by consumer interest organizations that make up for the lack of scientific information and/or a communication partiality from the producer.

Emerging skills

The results of the survey undertaken under F4G, interpreted and processed by the research team involved in the project with the participation of experts of applied R & D, experts of the training systems of the food technical figures, representatives of research and quality systems internal to SMEs, confirm the future trend scenario of the food industry towards product and process innovation, in order to adapt production to the evolution of supply and to changes in habits and market preferences. Innovation is everywhere in the food chain, from production systems of raw materials, to the design of products more responsive to consumer needs and market, the processes of transformation, conservation and packaging to improve product quality and its life shell. Not all innovations are valued in the eyes of the consumer, and not all innovation processes find immediate success in the market, nevertheless SMEs investment and attention to the interests of the consumer.

The growing need for innovation in the production process is aligned with the growing demand for profiles of engineers, technicians and technologists of the food industrial processes.

To meet the different inputs that affect food production (including environmental, market, consumer factors, etc.) and to improve the performance of innovation processes, that is to improve the relationship between innovation costs and the likelihood of market success, new ways of interaction between the stakeholders of the innovation process are emerging and, for SMEs, emerges the need to strengthen training approaches and policies for the design of an operational profile in innovation processes, able to:

- Increase the visibility of the added value of innovation to the production process,
- Anticipate the market acceptance of new products by consumers, experiencing early involvement strategies of consumer in product innovation design processes

- Encourage new methods for product design, production and value creation.

To avoid the risks of innovation success marginality in the food industry and to increase the capacity of the consumption trend interpretation of a critical consumer emerging profile, it is relevant for SMEs to strengthen the competency framework for the communication of innovation, to locate the proper information content to spread, to interact with industry and customer communication experts to transfer the correct value of innovation of the product to be presented on the market. The communication value to anticipate innovation acceptability by the client goes beyond the commercial marketing skills and is moving towards a dual path, i.e. on one hand it moves towards the implementation and integration of consumer demand, on the other hand towards the sharing of the innovation needs required by industrial production and processing processes and possible technological solutions, in order to motivate the choices in the research and design stages of innovation itself.

To stay in step with the evolution of the sector and to support the SMEs increasing use of innovation processes, for the technician and technologist profiles of food processes emerges the **need to strengthen their capacity to operate according to a multi-actor approach**, including technical and commercial roles operating within and outside the company, holders of sectorial logic that must work together to find their result in the product and process innovation. Cooperation should aim for a real involvement of different actors (end users, consultants, companies, etc.) in all stages of the process, from participation in the planning to the implementation and dissemination of results.

The emerging areas of expertise identified meet the need to facilitate synergies between stakeholders - within and outside the company - in order to increase the efficiency of innovation paths, to anticipate consumer reactions to improve the design of the product, manufacturing process, distribution systems and marketing solutions.

The emergence of key competences in Communication of Innovation describes the emergence of the **skills** of professional profiles operating in innovation processes, in-house, based on:

- Transformation of the qualitative exploration of consumer preferences and attitudes in innovation drivers
- → Translation of consumer perceptions in objective measurements
- → Anticipation of the estimate of the direct and indirect risks related to innovation
- → Identification and interpretation of the disadvantages and the direct and indirect benefits of innovation
- ➔ Demonstration of the effectiveness and the benefits of new solutions adopted in the process and the product
- > Communication and translation of a technical problem in a clearly understandable language
- → Negotiation, conveyance of innovation contents towards the interests of stakeholders, to find common points of interest.

The target on which we intend to act to strengthen SMEs' ability to communicate innovation, has been identified in the **technician and technologist figures** in food processes, holders of technical know-how for the development of innovative products and the implementation of innovation in production processes.

Below we propose the summaries of F4G target professional profiles, declined to feature in the company, the training recognized to date valid for the professional figures, the equivalence with the European training standards (EQF) and the classification code of the professional profile in the national (ISTAT for Italy) and international (ISCO, where possible) collection standards. We also give evidence, if possible, of the topic currently planned in vocational training, in terms of communication, and its incidence compared to the total number of hours of training.

The forms represent a summary of the programs available at national level. They do not, therefore, coincide with a single concrete case of training program, but in the section Bibliography - Education Pathways the references consulted at national level will be reported.

Country	Italy
Professional figure	Food processes technician
EQF	V level, in accordance with DPCM 25/01/2008 chapter II
Education level	Higher technical certificate
ISTAT Code	3.1.5.4.2
CompliancewithInternationalStandardClassificationofOccupations (ISCO-08)	3.1.2
Total hours	2000 of which 800 for internship
Hours devoted to the	Communication techniques=40 hours
topic Communication	Agro-food marketing = 30 hours
Main topics	 General scope English Language, Communication Techniques, Team Working, Computer Science and Multimedia, Applied Statistics, Agro-food marketing, Food law, Health and Safety on work, Business Management, Quality Management and Performance Management Techniques, Project Management Common technical and professional scope, Microbiology and food hygiene, HACCP and Food Safety, Sanitization of facilities, Pest prevention and control methods, Regulated and voluntary product certifications, Primary productions, Industrial processes and unit operations, Installation technologies of the food industry, materials, Technologies and equipment for packaging, Production management and lean production, Supply chain management and distribution logistics, Environmental sustainability of agricultural food production, Product development laboratory (PW) Specialized technical and professional scope Cereals technologies, pasta and bakery products; winemaking technologies of alcoholic beverages and vinegars; Technologies of fresh and preserved vegetables; Technologies of fresh, cured and preserved meat, Technologies of fish and canned fish
Function in the company	Locates and applies the production technologies according to the transformation processes Manages the food production programs Takes care of the quality and safety of food products and sanitizing processes of plants Performs design and feasibility studies, promoting product and process innovation Applies food compulsory and voluntary law
Communication of	In the internal processes: shares with production, marketing and commercial area
Innovation	managers the need answered by innovation.
(to be attained)	Participates in the construction of innovative content considering internal/external company collaboration systems
	Ability to: examine controversial issues, integrate opinions/different interests in commercial solutions according to "win-win" logic
	In external processes: participates in the preparation of content to be conveyed outside, following different registers of communications for the sale, for the

analysis of consumer needs, for processing and interpretation of the Sales industry feedback.

Country	Italy
Professional figure	Food processes technologist
EQF	VII level
Education level	Degree in Food Science and Technology
ISTAT Code	2.3.1.1.4.
CompliancewithInternationalStandardClassificationofOccupations (ISCO-08)	2.1.3
Total hours	180
Hours devoted to the	There are no issues concerning the communication and/or marketing area.
topic Communication	Among the educational objectives of the degree course, defined by Minissterial Decree, there is "having developed personal communication, multidisciplinary team-working and judgment skills from a technical, economical, human and ethical point of view".
Main topics	THREE-YEAR DEGREE (Food Technology L-26); Viticulture and enology (L-26)
	MASTER DEGREE: Food Science and Technology (LM-70)
	General and Physical Chemistry, Organic Chemistry, Physics, Mathematics, Plant products, Political economy and statistics institutions, English Language, ICT and Information Society
	Biochemistry, Analytical chemistry, Foodstuffs Conservation, Animal products, Microorganisms Biology, Agribusiness economics, Food industry plants
	Physical and chemical analysis of food, Hygiene and HACCP, Food microbiology, Human nutrition, Food technology processes
Function in the company	Designs and elaborates food products
	Creates and manages the quality system control in the food production sector
	Provides consultancy services for the agro-food companies, in order to:
	analyse the needs expressed by the customer
	plan interventions targeted to meet the needs detected
	implement the interventions according to the programming
	make changes to interventions in case of criticality

Country	France
Professional figure	High-level technician (quality, production, etc.);
EQF	V level
Education level	DUT – Technology University Degree
	BTS – Higher technician certificate
	BTA – Agricultural technician certificate
ISTAT Code	475a Research - development and production methods in the processing industries technicians
	475b Production and quality control in the processing industries technicians
Compliance with	2 Professionals
International Standard	First stage of tertiary education - medium duration;
Occupations (ISCO-08)	Second stage of tertiary education - leading to an advanced research qualification
	3 Technicians and associate professionals
	First stage of tertiary education, first level (short or medium duration)
Total hours	
Hours devoted to the topic Communication	
Main topics	
Function in the company	The quality technician works in the company by applying specific knowledge of the quality functions, develops and monitors the processes and working methods and the management of production processes. Cures the production trend, applying quality management tools. Knows the organization, its operation and the communication flows within the company.
Communication of Innovation	
(to be attained)	

Country	France	
Professional figure	Agro-food engineer, Product research engineer, Production Engineer, Quality Engineer	
EQF	VII level	
Education level	Engineer degree - food specialty	
ISTAT Code		
CompliancewithInternationalStandardClassificationofOccupations (ISCO-08)		
Total hours		
Hours devoted to the topic Communication		
Main topics		
Function in the company	ey role in development and design processes of new products, containers, ackaging or production processes. erforms her/his function in close contact with the marketing and production epartments and suppliers of raw materials, with other professionals involved in roduct design and in R & D. Oversees the different steps of innovation, from research of materials and raw naterials to the realization of the prototype, creation of testing and validation of the production model. She/he also follows the implementation of innovation and he launch of the product on the market. he quality engineer term includes the quality specialist who has relationships with nanagement and with all operating managers: research and development, roduction methods. She/he plays a central role in the certification process of the roducts/processes for the registration of a mark of quality for the company's roducts. If necessary, she/he intervenes with corrective or preventive actions on perational processes. In case of failure or error, she/he analyses their causes, ffers solutions sharing them with the concerned areas. Compared to the final product, she/he validates compliance with the initial specifications, the rules and egulations.	
Communication of Innovation		
(to be attained)		

Country	Spain
Professional figure	Food industry technician
EQF	V level
Education level	Technical higher degree in processes and quality in food industry
	(Real Decree 451/2010)
ISTAT Code	
CompliancewithInternationalStandardClassificationofOccupations (ISCO-08)	
Total hours	2000
Hours devoted to the topic Communication	None
Main topics	Food technology.
	Food biotechnology.
	Food analysis.
	Food manufacturing and preservation treatments.
	Organization of food production.
	Marketing and logistics in the food industry.
	Quality and environmental management in the food industry.
	Electromechanical maintenance in processing industries.
	Food microbiological and sensory control.
	Nutrition and food safety.
	Integrated processes in the food industry.
	Food innovation.
	Project in processes and quality in the food industry.
Function in the company	Organizes and controls food processing processes, programming and monitoring operations and material and human resources, applying the production plans, quality, food safety, prevention of occupational hazards and environmental protection in accordance with current legislation.
Communication of Innovation (to be attained)	None

Country	Spain
Professional figure	Food technologist
EQF	VII level
Education level	Bachelor's degree in Food Science and Technology
ISTAT Code	
CompliancewithInternationalStandardClassificationofOccupations (ISCO-08)	
Total hours	2400 -3000
Hours devoted to the topic Communication	There are 6 ECTS for Marketing but none specifically for communication
Main topics	Physics
	Physiology
	Mathematics
	General Chemistry
	Biostatistics
	Introduction to food sector
	Microbiology
	Organic and Inorganic Chemistry
	Thermodynamics and chemical Kinetics
	Analysis of foods
	Food Chemistry and Physics
	Raw materials from vegetal origin
	Food microbiology and parasitology
	Food Hygiene
	Nutrition
	Principles of Food Engineering
	Proceses in Food Industry
	Processing technology for animal foods
	Processing technology for vegetable foods
	Production management
	Economics
	Management of food Quality and safety
	Marketing
	Practicals in companies
Function in the	Management of food quality
company	Monitoring of processes and products

	Management of food safety
	Implementation of quality systems
	Application of legislation
Analysis of microbiological hazards risks	
Food analysis	
	Process and product development
Communication of	
Innovation	
(to be attained)	

The analysis of the skills, abilities and knowledge implemented by both food technician and technologist profiles, in the activation, implementation and monitoring of product and process innovation systems, projected in the transformation of industry innovation systems (characterized by multi-actor approach, interdisciplinarity) brings out their role as the hub of technical scientific content to interact with experts from product and process certification systems and can enhance the sales and marketing systems, contributing on two fronts:

- → to receive and interpret consumer needs expressed by the market, helping to define the needs interpretation programs and the development of complex innovative solutions, capable of responding to an articulated demand for consumption;
- → to select and highlight information about innovation, articulating content specific to different targets

The purpose of communication conveyed by the technician and technologist relate to two areas, namely:

- → to know how to communicate the innovation to enhance the effort of SMEs, in any area and chain shift this would happen;
- → to know how to generate consensus on product and process innovations urging the knowledge of innovation purposes towards medium and long term challenges of the industry.

Emerging powers to govern the effects of the multiplicity of areas of innovation relate to the ability to manage multi-actor contexts, delineated by all of those involved in the development of knowledge and in the application of innovation, and to take strategic decisions in uncertain situations (management of uncertainty). According to the results of the desk and on field survey carried out in the first phase of F4G, **emerge 4 integrated skills areas** in the food technician and technologist professional profiles, in order to improve her/his overall ability to interact in the agro-food innovation contexts.

The 4 areas of expertise and key learning objectives, listed in the table below, express the result of the sharing and interpretation of the evidence emerged from the research phase of F4G with the project partnership, evidence of the interdisciplinary approaches to innovation taken by the research (IRTA), businesses (MENABREA BEER and CASA MAS), training (ITS, UNITO, SFC) and communication and mediation organizations (ECOTROPHELIA, OPGA).

On the basis of well defined competence areas, it would be appropriate to apply the methodology and the Flipped Classroom tools for the design of experimental training.

SKILLS AREA	TECHNICIAN	TECHNOLOGIST
1 Pasic skills	Objective (she/he will be able to)	Objective (she/he will be able to)
I. Dasie skiiis	Be able to know the organizational features of the company and the actors involved in the decision- making process, and own basic corporate team building and communication techniques and styles	Be able to know the organizational features of the company and the actors involved in the decision- making process, and own basic corporate team building and communication techniques and styles
	Learning Outcomes	Learning Outcomes
Knowledge of organizational features		
Team building tools		
Knowledge of main communication concepts		
Knowledge of effective communication strategies		
Write clear reports		
Knowledge of quality procedures		
Identify dis/advantages of innovation		

SKILLS AREA	TECHNICIAN	TECHNOLOGIST
2 Market and Strategic	Objective (she/he will be able to)	Objective (she/he will be able to)
influencing	Given an innovative product, the ability to understand market and to identify and map relevant stakeholders in term of their position, level of influencing, relevance, interest and position.	Given an innovative product, the ability to understand market and to identify and map relevant stakeholders in term of their position, level of influencing, relevance, interest and position.
	Learning Outcomes	Learning Outcomes
 Market and competitors 		
 Stakeholders mapping 		
➔ Risk management plan		

SKILLS AREA	TECHNICIAN	TECHNOLOGIST
3 Communication	Objective (she/he will be able to)	Objective (she/he will be able to)
5. Communication	Once identified relevant stakeholders, the ability to rightly communicate innovation through the development of a consistent communication strategy in order to build up consensus about the innovation proposed.	Once identified relevant stakeholders, the ability to rightly communicate innovation through the development of a consistent communication strategy in order to build up consensus about the innovation proposed.
	Learning Outcomes	Learning Outcomes
Communication strategy		
Communication plan		

SKILLS AREA	TECHNICIAN	TECHNOLOGIST
4. Negotiation:	Objective (she/he will be able to)	Objective (she/he will be able to)
	Ability to influence relevant stakeholders, when appropriate, through negotiation skills. Ability to maintain an awareness of goals and objectives and to navigate solutions towards desired ends, while maintaining relationships and supporting consensus.	Ability to influence relevant stakeholders, when appropriate, through negotiation skills. Ability to maintain an awareness of goals and objectives and to navigate solutions towards desired ends, while maintaining relationships and supporting consensus.
	Learning Outcomes	Learning Outcomes

Basic skills

To be aware of the organizational features of the company and the actors involved in the decision-making process and to own basic corporate team building and communication techniques and styles

Learning Outcomes identified for Basic Skills area:

- → Knowledge of organizational features
- ➔ Team building tools
- → Knowledge of main communication concepts
- ➔ Knowledge of effective communication strategies
- ➔ Write clear reports
- ➔ Knowledge of quality procedures
- → Identify dis/advantages of innovation

Market and Strategic influencing

Given an innovative product, the ability to understand market and to identify and map relevant stakeholders in term of their position, level of influencing, relevance, interest and position.

Learning Outcomes of the skill area are:

- Market and competitors
- ➔ Stakeholders mapping
- → Risk management plan

Communication

Once identified relevant stakeholders, the ability to rightly communicate innovation through the development of a consistent communication strategy in order to build up consensus about the innovation proposed. Learning Outcomes are:

- ➔ Communication strategy
- ➔ Communication plan

Negotiation:

Ability to influence relevant stakeholders, when appropriate, through negotiation skills. Ability to maintain an awareness of goals and objectives and to navigate solutions towards desired ends, while maintaining relationships and supporting consensus.

Research Methodology

The first phase of the F4G Project has been dedicated to the desk and on field research, aimed at consolidating the emergence of innovation trends in the sector and at identifying emerging key skills in communication of innovation in the agro-food technician and technologist.

Desk Research has been set on finding secondary data regarding the main areas of interest of the plan, namely:

- → innovation: the main sources used are referred to the European scene. That is data coming from Eurostat, FoodDrinkEurope, OECD, referred to the main economic indicators of the sector and to the impact of innovation by area of intervention and to the identification of leading sectors in innovative processes. The detection of Food & Beverage industry innovation trends completes an in-depth analysis on the single countries involved in the project, namely Italy, France and Spain, and on the documents aimed at the development of the sector.
- → communication skills: the study and preparation programs for the profile of the agro-food Technician and Technologist were collected and analysed, to identify areas of communication already foreseen for the in programs of study, the incidence of communication issues with respect to the number of training hours, the communication skills provided as an output of degree courses. To contextualize the research work, we report in the appendix of this document some summaries of the professional training profiles of reference.
- → the data framework is completed by the collection of some best practices related to the sharing of agricultural and food innovation processes.

The tools for the collection of secondary data were processed by SFC and shared with project partners. Their processing helped to identify items of interest towards which the next on field research phase must be oriented, aimed to detect some aspects of the innovation attitude by companies and the perception of the skills adjustment of technical profiles towards the evolution of the innovation processes. The on-field analysis involved both enterprises and training organizations and institutions of the professional figures of reference for F4G.

The **on field** survey achieved the numerical targets set in the design phase and is adequate to the quality indicators provided in the project and in the Quality Plan of the project, by providing:

- → 57 compared to 40 questionnaires filled out by teachers of training institutions (V EQF) and universities (VII EQF), coordinators of the training institutions of the countries involved in the investigation stage, compiled in compliance with the completeness and accuracy indicators of the methods of preparation of the questionnaire;
- → 24 compared to the 15 questionnaires completed by companies in the sector, filled out in compliance with completeness and correctness indicators of the methods of preparation of the questionnaire;
- → 25 training institutions, schools, universities compared to the 10 reported in the planning stages, involved in the survey.

The results are available at the SFC archives. The results of the first and second research phase have been developed and shared with the project partners, have focused the discussion on emerging skills and led to the identification of the main areas of intervention of both professional profiles to whom are dedicated the experimental paths of training sessions on communication of innovation. The Training Mobility Program and the Multiplier Event made in Turin in July 2016 made it possible to expand the sharing of the results to a target of experts of education and applied research in the agro-food sector. The results of this further sharing have facilitated the declination of skills, abilities and competencies that professionals working in the company will have to develop to support their role in communication of innovation processes, redefining the thematic areas of the Training Model.

After the trainers training, provided by the University of Turin during the Training Mobility planned in F4G, centred on the Flipped Classroom methodology and the tools for the development of training programs, the [Tapez un texte]

maps of emerging skills areas have guided the allocation, to each project partner, of a specific area of expertise to be developed.

1	

It's important to note that, as a methodological aspect and approach to the development of training courses, the final model of training for the acquisition of the skills in communication of innovation, oriented to the food technician and technologist, is designed as a deliverable with an incremental character. It means that, after an initial release of training units related to the different areas of key skills, is planned their experimentation in the contexts identified for each partner country of the project and later validated for the final release. The experimental contexts identified are:

- → in Italy, we recognize the experimental context of ITS Parma and Birra Menabrea company,
- → in Spain, the INSTITUT DE RECERCA Y TECNOLOGIA AGROALIMENTARIES, together with the CASA MAS company guide an experimental path
- → in France, the Ecotrophelia partner is experiencing an experimental intervention of the students' education level, thanks to an international competition context to assess the impact of emerging skills in identifying paths of innovative proposals for agro-food products, developed by 16 / 18 years old students.

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Training Paths:

<u>For Italy</u>, the training paths of the **food industry Technician** coincide with the training courses supported by the ITS. In particular, in Italy, there are 5 ITS of the sector, with a training offer co-financed by the OP ESF 2014-2020. The courses reflect, in some cases, the characteristics of traditional and/or emerging products of the local food chain, as in the case of ITS Piedmont. All analysed paths are recognized by the Ministry of Education and apply to take the State exam for the issuance of the Higher Technical Diploma, V EQF level. The training courses considered are:

- Higher Technical Diploma for the foodstuffs marketing and enhancement technologies (ITS PARMA, ITS TERAMO, ITS PUGLIA, ITS CONEGLIANO)
- Higher Technical Diploma for the food design and production technologies (ITS PARMA, ITS TERAMO, ITS PUGLIA)
- Higher Technical Diploma for brewing production and transformation Brewmaster; (FOOD ITS FOR PIEDMONT);
- Higher Technical Diploma for the production and processing of fruit and vegetables; (FOOD ITS FOR PIEDMONT);
- Higher Technical Diploma for cereal and rice production and processing (FOOD ITS FOR PIEDMONT);
- Higher technician Diploma for the agro-food environment management (FOOD ITS OF TERAMO)
- Higher Technical Diploma for Agro-Food and Biological Preparations (ITS BIO CAMPUS LATINA)

• Higher Technical Diploma for Agro-Food and Biological Production (ITS BIO CAMPUS LATINA) For the figure of the food **technologist**, the training courses relating to the "Food Science and Technology" (LM-70) degree course were analysed, by consulting the educational objectives and training activities qualifying the path of Master degree in food and agriculture Biotechnology, as defined in the Ministerial Decree of 16 March 2007 and subsequent amendments.

For France

The technologist profile refers to university courses developed by the universities: AgroParisTech, AgroCampus Ouest, Montpellier SupAgro, ENSAT in Toulouse, ENSAIA in Nancy, ENSBANA in Dijon, ENITIAA in Nantes, INSFA in Rennes, ENITA.

i Petruzzella D., Antonelli A. (2015). "Social roots: la piattaforma di innovazione sociale dove si coltivano le buone idee dell'agrifood", Working Papers n° 10 - Fondazione Giacomo Brodolini

The food industry is considered a low potential for innovation, if you measure the ratio of investment in R & D and turnover or added value). CIS, the food industry is consistently among the very last places of the manufacturing sectors on this indicator; in OECD countries (Organization for Economic Cooperation and Development), the intensity of the food industry research is about 0.3%, while the pharmaceutical sector recorded 11%, and the average of the manufacturing industry is 2.4 %.

Annex 1: Growth of the agro-food sector: the role of innovation

How Innovation impacts on the overall Growth of the Sector

1. Agro-food uncertainty scenarios

Future is not known. As in other sectors, also in Agro-food we stick to some uncertainties: either the demand growth for biomass and the supply growth of biomass (primary sectors - agriculture, forestry, fisheries & aquaculture) are unknown in the medium term; the global demographic trends are still uncertain in the long term; the technology push deriving from bio-chemical research and innovation is not know in the medium term, also due to the different regulatory frameworks all over the world.

2. The research and innovation new needs.

On these uncertainty scenarios some key questions arise:

- Is the current research & innovation (and policy) agenda solid across all these different scenarios to comply with the demands of innovation?
- Do different scenarios offer **new** opportunities and/or challenges to the Agro-food sector, particularly to our SMEs?
- Do scenarios have different **implications** for actors, sectors, companies, regions, ecosystems, etc.?
- At what geographical level do different scenarios apply: world/EU/region/local?
- Which is the role of local Agro-food chains and local citizens/consumers new needs?

3. The European principles on bioeconomy

Yet we have some European principles to face these different scenarios and uncertainties, named the **bioeconomy Principles**: Food comes first in our choices! Yields and food manufacturing have to be sustainable. We apply the cascading approach, it means food first, followed by byproducts, then feed, non food applications and, last, energy uses. Also the new slogan: "circularity" has to be considered in designing new models for our Agro-food economy. We have not to forget the maintaining of the richness of diversity, not only in biology, but also in traditions and cultures.

4. The Agro-food Response capacity

The first response of the Agro-food Sector is named the **"Ecological intensification"**. It means using the regulating functions of nature (functional ecology), from input substitution (e.g. predator instead of pesticide, biomimicry, new molecules) to landscape-level agroecosystem design, from mono-species/environment studies to the study of groups of organisms in relation

to each other and the environment (community ecology), to be supported by -omics and big data.

The second response is always cited as the "digital revolution": it includes precision agriculture (remote sensing, sensors, ...), search for Farms and Factories of the future (mechatronics, photonics, robotics, additive manufacturing, ...), enabling tools and methodologies for dealing with diversity, different qualities, etc.

The third response to different scenarios is **adaptation**, in particular the "Resilience for a sustainable bioeconomy". It means the management of hazards (immediate shocks + long-term changes), the increased coordination and integration of different sub-sectors, the effects on animal, plant and human health hazards as well as adaptation and risk reduction strategies. But, on the other way round, what is the impact of the bioeconomy on resilience? What new solutions and systems can be developed that are more resilient, from a biological and technological point of view as well as a social perspective? How can changes in consumption create opportunities for the bioeconomy? New rooms for research and innovation!

The fourth response is **energy**, specifically the new energy landscape. It would be for the future, how guaranteeing renewable electricity + heat generation, which impacts on inputs for primary production (fertilizer, pesticides, machinery,...), which kind of direct impact on primary production and manufacturing, and logistic and retailing?

Last but not least, we have always to consider the **socio-cultural dimensions** of the Agro-food economy! The Knowledge about social impacts of technology and mechanisms of social change should progress as fast as technology itself.

All stakeholders (primary producers, processors, consumers, citizens, etc.) should be fully involved in the governance of the agro-food economy. Science may also radically change food production and consumption patterns, with the potential to reduce pressure on ecosystems, through changes in diet, multifunctional use of land and aquatic resources, urban-rural nutrient cycles and production of alternative proteins for animal feed and human consumption. This may break established routines and create resistance and anxieties, which need to be better understood. In addition, these approaches have legal implications that need to be understood and addressed by research, Authorities, company representatives.

5. The Governance and the political economy of the Agro-food Sector

The outcomes of the Agro-food economy will depend on the rules put in place to regulate the system. Bio-based materials and bio-energy may create pressure on natural resources and on social inequalities in a scarcity-dominated world. Bioeconomy is more than a set of bio-based activities. It involves both positive and negative externalities influencing the future of the biosphere and the ways in which societies will use it. So, the Agro-food economy governance is critical. Research and Innovation should help develop a framework aimed at fostering the Agro-food economy and should consist of policies and sustainability and safety standards that are coherent, and create a level playing field, avoid the overexploitation of natural resources and foster a diversity of practices with small environmental impacts.

6. Delivering the consumers and society safe and high quality food

With regards to a mature sector as the Agro-food one - mature as you may see ...! - and having in mind to analyse and to understand its internal dynamics, an expert of innovation process has to involve the whole supply chain - from primary production through processing and manufacturing to retail and food service - as well as companies that supply into this chain. Also, the main themes into which the bottom up needs of the agro-food SMEs are classified tend to reflect this 'whole supply chain' approach - from primary production through manufacturing and supply of the product and packaging, to food, drink and the consumer. No restriction is placed on whether the needs would be met through basic, strategic or applied pre-competitive activities or through more 'near-market' innovations.

There is still a considerable discussion about the 'drivers' creating the needs, as we saw before. These are more fluid, but it became evident that the primary drivers of the agro-food sector are currently: **Safety; Quality and value; Nutrition, health and well-being; Environmental sustainability; Resilience and efficiency; Skills and knowledge and technology transfer**.

Considered together, the drivers and the supply chain build the arena which illustrates how a particular driver might create different needs at different points in the chain. For example - 'food safety' creates the need for assurance systems through primary production and manufacturing whilst with the finished product there might be a need for tools for analyzing particular hazards should a problem arise.

These 'principal areas of need' are organized in line with a matrix schema. As our approach spans the whole supply chain, it has not listed detailed sector-specific needs, but horizontal ones. However, each area of need can be viewed in the context of a sector or supply chain stage - for example, for that sector's raw materials, ingredients, processes and practices.

In our experience, a number of recurring needs arose, which are common to different parts of the supply chain or from distinct but related drivers. Some of these are worth highlighting: assuring product safety through quality assurance and analytical tools Encouraging consumer well-being through a healthy diet; Protecting consumers and industry from food fraud; Encouraging sustainable practices such as better crop protection and reduced use of resources, tackling industry's 'skills shortage'.

A statement of needs – what it is that the food and drink supply chain needs from science, technology and their practical application in order to continue delivering safe and wholesome products that meet the needs and wants of consumers – has to be listed to organize a number of activities, examples of which include:

- → pre-competitive research program and tailored, company-specific innovation projects;
- → scientific, technical and knowledge-based services (e.g. courses, seminars, publications and databases);
- → research and innovation in other organizations (e.g. universities, research institutes, RTOs) and individual companies,
- → raising awareness of industry needs amongst government departments, agencies, funding bodies, standards organizations and other third parties to stimulate and inform new approaches in the application of science and technology.

Collective provision of innovation, technical support and 'routine' services is made through strategic collaboration between wide-ranging, interdisciplinary and internationally dispersed third parties that serve the food and drink supply chain.

Annex 2: Communication as a tool to support innovation process

Innovation is a growth lever for companies and in particular for Food and Beverage sector. A good innovation is an innovation which meets its consumer. An effective innovation requires, amongst the other tools, communication.

Food technicians master the innovation process but there is a lack of competence in communication that could break the European Food and Beverage know-how.

Food and Beverage Industry must improve its communication on its value enhancement. It therefore needs to boost its visibility and credibility by relying on its values, Quality and Safety, its commitment with the Environment and Health. This will significantly improve the perception that society has of Food and Beverage

Industry, which will begin to identify it as strategic. These actions also contribute to project a strong image of European Food and Beverage industry associated with Quality.

Being essential in an increasingly e-business culture, Communication must be able to promote new communication ways between different channels and customers.

According to these considerations, in this chapter, different ways to improve communication and best practices on Food and Beverage industry have been identified and analysed below. Moreover, a special attention has been given to the international competition "Ecotrophélia" which is becoming more and more sophisticated and relevant for the purpose of the Food 4 Growth Project.

1. Open communication supports innovation

The *Figure 1: Conceptual Framework for improved communication* shows the link between internal communication, external communication and the process of innovation. It is therefore important to realize that it is a global management including communication strategy and innovation process which is successful. This Figure was made by a European project, Connect4Action, to foster communication of new technologies. But it can inspire for improving communication of innovation.



Figure **Erreur ! Document principal seulement.**: Conceptual Framework for improved communication¹

Systematic creation and usage of human potential is a precondition of building and developing of strengths and competitive advantages of organizations. A company has a great potential, when it is able to apply the knowledge and experience of its employees and achieved "innovation" results of its work, whether they have been recorded or not and when it is able to absorb the latest knowledge from external environment, use all available resources and means with optimal efficiency and sustain their optimal structure, which indicates that open communication in a company is the key factor affecting its ability to succeed in competitive environment and it is also a predictor of open communication towards external partners.

Communication influences the innovation process in each organisation in a great extent. Many studies implied that a great amount of problems occurred during the innovation process is a result of ineffective or unreliable communication, particularly among different functional departments of the organisation involved in the innovation process. It is therefore important to put emphasis on the development of open and quality communication. It is possible to use new technologies like "groupware" (group software), intranet or social

knowledge networks for this purpose. Teamwork activities and such aspects as communication and support for innovation can lead to group learning and making performance.

2. Innovation is good, but you have to let the consumers know about it!

Communication strategies encourage consumers to make a response, either by requesting further information or purchasing a product. You can improve the effectiveness of your strategies by building a greater understanding of consumers' individual needs and preferences and personalizing communications. Strategies that build dialogue with consumers create trust and provide you with feedback that enables you to fine-tune your communications even further.

➔ Awareness

Successful companies aim to build strong relationships with consumers so they can retain those consumers as long-term customers and maximize revenue opportunities. Therefore, the first task for a communication strategy is to make consumers aware of your company and products. When consumers are buying, they make decisions based on the information they have about an available product. By communicating through advertising or other media, you can make consumers aware of your product so it becomes one of the alternatives they consider.

➔ Choice

Product communication through media such as advertising promotes choice for consumers. Communication informs consumers about the differences in price, quality or features of competing products, enabling consumers to make informed choices. Packaging is another important way to communicate to the consumer.

➔ Preference

Your initial communication raises consumers' awareness of your products. By communicating regularly, you can make consumers aware of the benefits of your products, differentiate your products from those of your competitors and create a preference for yours. If the communication strategy is effective, it will convince consumers to choose your product over the competition next time they make a purchase.

➔ Accountability

Communication strategies that encourage consumers to provide feedback on your products demonstrate that your company is accountable to its customers. Setting up an online forum, for example, allows consumers to post their comments on your products and share their views with other consumers. Interactive communication like this recognizes the changes in the way consumers respond to advertising, according to the Journal of Interactive Advertising. Consumers can now source their information on products and companies from other consumers via social networking sites, rather than just responding to marketing messages from manufacturers and retailers.

Personalization

A strategy based on personalized communication builds a one-to-one relationship between your company and individual consumers. By collecting and analysing information on consumers' purchasing patterns and communication preferences, you can develop tailored communication via

email. Personalized communications give consumers information on products or services that they are likely to be interested in. This indicates to consumers that you understand their needs and will not waste their time on irrelevant offers.

3. Elaborate your Communication Strategy in 5 steps!

Launching of new products to market is not easy. It requires a lot of internal and external research, a detailed context analysis in which the company will develop it, what is the status of competitors, what is the general opinion that the public and the media have on the sector and which agents can affect their evolution. Considering this and as explained in previous section, a communication plan can be developed in 5 steps:

→ Making a SWOT analysis, as described in Figure 2, to detect what is the initial situation and especially what will be the differential advantages that our new brand will bring in the market and that will help us to position it. We must transmit and highlight in any information we launch: towards the media, to our stakeholders in our Social Media channels or Newsletters, in corporate events, etc.



Figure Erreur ! Document principal seulement. : SWOT Analysis

- → Before launching to the market deciding what role our products or services will play in the market and in the lives of consumers. Once we have established this, we will develop offers and experiences necessary to captivate our audience and start earning our first customers.
- Determining the tone of communication that our brand will have. We must create a communication style unique and easily identifiable by the public. Our style must be aligned with our philosophy, values, vision and mission and should help achieve the objectives of Marketing.
- → Betting for creating relationships. Beyond the (necessary) economic benefits, it is essential for a company to have a long-term view so we need to create relationships based on trust with your audience. It's vital to develop this strategy with your clients, providing authenticity, transparency and honesty (the three values that consumers most appreciate in a brand)
- Depending on the speed of evolution of the product, reviewing the situation and seeing how and where it has grown. Being a new product, it is logical that its situation changes with time. It will be beneficial to communicate major structural changes and achievements (new expertise, new business

lines, exceed certain turnover figures or customers, etc.), as it will reinforce the consolidation and company image among consumers and face media.

In short, if we have to define what three concepts have to be in our mind to launch our new brand, these are: research, strategy and constant alert.

4. Tips for a promotion strategy

The promotion is to communicate, inform, raise awareness or recall the existence of a product to consumers and persuade, motivate or induce the purchase or acquisition. Some strategies that can apply, related to the promotion are:

- → Place ads in newspapers, magazines or the Internet.
- → Create traditional or electronic newsletters.
- ➔ Participate in fairs.
- ➔ Create tasting jobs.
- → Create activities or events.
- ➔ Sponsoring institution or any other company.
- → Placing advertisements in company vehicles, or public transportation vehicles.
- → Create posters, flyers, presentations, brochures or advertising calendars.
- → Create sweepstakes or contests among our customers.
- → Find creative ways to advertise, as Guerrilla Marketing.
- → Send direct mail or flyer for specific areas.
- → Insert in magazines or specialized newspapers, airlines or bus.

5. Tips for a promotion strategy 2.0

Promotion 2.0 is promotion through communication tools 2.0 or better online. Some strategies that can apply, related to the promotion are:

- → Create an attractive and dynamic Web page.
- → Create a blog and post articles of interest to our potential or current market.
- Actively participate in social networks in which our market is located.
- ➔ Create Video Marketing.
- ➔ Create a channel Podcasts.
- → Use mobile applications to promote them through advertising.
- → Generate SEO and SEM strategies.
- → Create email marketing campaigns.

6. The future of food

Food of future regroups many aspects of the product:

- → Intrinsic values: quality and safety, taste, composition
- > Extrinsic values: the service providing as easy to use, its social and environmental impacts

Both of these two aspects of food product, illustrated in Figure 3, have to be communicated in order to meet the consumer expectations and so meet the market.



Figure **Erreur ! Document principal seulement**.: Consumer Trendsⁱ

In addition, the food industry has a great challenge to address: face the global population boom to feed the world nutriously and sustainably. The world is changing fast and so is the food industry. Consumers are struggling to know how to deal with that. In this context, simple communication of complex advances will be crucial. If you talk about food creativity, consumers will accept it. If you talk about food technology and science, this may create a level of mistrust. There is a common language to be establish between these two actors.

The food companies will need some pedagogy to explain what they do and how their activity evolves in order to preserve the link they have with their consumers. It concerns the language to adopt but not only. The development of media requires also new competences in communication.

Thus the achievement of the launching of a new food product needs first technical skills to ensure the intrinsic values and second communication skills to promote the extrinsic values. The competition Ecotrophélia aims to develop these competences to food technician.

ECOTROPHELIA: learning about innovation and communication in food by project

What will be tomorrow's food look like? Taste like? Be made of? What are the major trends in food consumption in Europe?

Whether French, Italian or European, the agro-food businesses all face the challenge of innovation to continue to create value in mature markets, as are most European markets, whilst being capable of addressing the developing markets to find new sources of growth; the ability to innovate in an international environment is no longer an option, it is an obligation!

And now more than ever, we cannot innovate alone: innovative companies must be open to their external environment, receptive to the market and consumers and also be connected to the world of research.



ÉCOTROPHÉLIA E U R O P E

The ECOTROPHELIA Europe competition provides answers to these questions through the imagination of teams of engineering students working within the food industry and the expertise of the National Food Federations which accompany them.

ECOTROPHELIA has the ambition to promote entrepreneurship and competitiveness within the European food industry by implementing a training network of excellence in food innovation and organizing National and European food innovation competitions, "The Student Food Innovation Awards", a real eye-opener for the food industry.

ECOTROPHELIA achieves the goal of bringing together students, teachers, researchers and professionals of the food sector in a network to think about tomorrow's innovative food products. Created in the wake of ECOTROPHELIA France, Europe ECOTROPHELIA, a real Champions League in Food Innovation, is above all an adventure that quickly met with success. Since 2011 ECOTROPHELIA Europe has motivated the organization of 60 national competitions, mobilized more than 500 universities and nearly 3 000 European students and the development of more than 350 products. This success is the result of broad partnerships at local, national and European levels. The different players found an interesting complementarity to create a dynamic structure that is beneficial to the entire industry.

How does the competition work?

In every European country, the National Food Federation and HEI (Higher Education Institutions such as Universities, High schools) organize a national event in order to select the most innovative food project. Teams form with between 2 to 10 students, from European private, scientific, commercial or public higher education institutions, around an innovative idea.

As part of their educational project, student teams develop their food project according to precise specifications. The main assessment criteria relate to the innovative dimension, the ability to integrate the distribution channels, the organoleptic and nutrition qualities, the aptitude for industrial manufacturing, regulatory compliance and market relevance of the product.

As part of their project, teams must develop a coherent food innovation project corresponding to precise specifications stipulating that:

- → The product must be suitable for human consumption
- → The product is commercially relevant and it can be sold by traditional distribution channels (hypermarkets and supermarkets), specialised distribution channels (organic food shops, for example) or eating out (restaurants, cafes, hotels)
- ➔ The product must be innovative with regard to the existing offer, whether by its concept, its manufacturing process, formulation or packaging,
- → The eco-innovation dimension should be optimized to minimize the environmental impact of the product (by the choice of raw materials, packaging or the production process)
- → The product must demonstrate its organoleptic and nutritional qualities
- → The industrialization of production is possible

→ The regulations are followed.

Particular emphasis has been added to make them develop their <u>communication skills</u>: A description of the communication strategy specifying the privileged axes, message content, and media and channels available for the following targets:

- → consumers (social networks, radio promotion, advertising etc ...)
- → and / or buyers distributions (communication to central purchasing).

Each team can develop the project with the support of companies, teachers, researchers, laboratories or technical centres.

ECOTROPHELIA Europe succeeds the daring challenge of mobilizing stakeholders in higher education, research and food industries to allow the creation of the eco-innovations of tomorrow.

This is the real challenge of deploying ECOTROPHELIA at European level, whose highlight is the organization of a European final that annually brings together the best European teams for a competition of the highest possible level; excellence. This experience, challenging, rewarding and demanding, puts the future managers of the European food industry in the forefront: the younger generation is well aware of the challenges of sustainable production and responsible consumption and formed through project management in a multicultural context.

Their technical, commercial and communication skills will be at the service of the competitiveness of European companies of tomorrow.

ECOTROPHELIA Europe is now a major event for European innovation and competitiveness of agribusiness.

Research Methodology

The first phase of the F4G Project has been dedicated to the desk and on field research, aimed at consolidating the emergence of innovation trends in the sector and at identifying emerging key skills in communication of innovation in the agro-food technician and technologist.

Desk Research has been set on finding **secondary data** regarding the main areas of interest of the plan, namely:

- → innovation: the main sources used are referred to the European scene. That is data coming from Eurostat, FoodDrinkEurope, OECD, referred to the main economic indicators of the sector and to the impact of innovation by area of intervention and to the identification of leading sectors in innovative processes. The detection of Food & Beverage industry innovation trends completes an in-depth analysis on the single countries involved in the project, namely Italy, France and Spain, and on the documents aimed at the development of the sector.
- → communication skills: the study and preparation programs for the profile of the agro-food Technician and Technologist were collected and analysed, to identify areas of communication already foreseen for the in programs of study, the incidence of communication issues with respect to the number of training hours, the communication skills provided as an output of degree courses. To contextualize the research work, we report in the appendix of this document some summaries of the professional training profiles of reference.

→ the data framework is completed by the collection of some best practices related to the sharing of agricultural and food innovation processes.

The tools for the collection of secondary data were processed by SFC and shared with project partners. Their processing helped to identify items of interest towards which the next on field research phase must be oriented, aimed to detect some aspects of the innovation attitude by companies and the perception of the skills adjustment of technical profiles towards the evolution of the innovation processes. The on-field analysis involved both enterprises and training organizations and institutions of the professional figures of reference for F4G.

The **on field** survey achieved the numerical targets set in the design phase and is adequate to the quality indicators provided in the project and in the Quality Plan of the project, by providing:

- → 57 compared to 40 questionnaires filled out by teachers of training institutions (V EQF) and universities (VII EQF), coordinators of the training institutions of the countries involved in the investigation stage, compiled in compliance with the completeness and accuracy indicators of the methods of preparation of the questionnaire;
- → 24 compared to the 15 questionnaires completed by companies in the sector, filled out in compliance with completeness and correctness indicators of the methods of preparation of the questionnaire;
- → 25 training institutions, schools, universities compared to the 10 reported in the planning stages, involved in the survey.

The results are available at the SFC archives. The results of the first and second research phase have been developed and shared with the project partners, have focused the discussion on emerging skills and led to the identification of the main areas of intervention of both professional profiles to whom are dedicated the experimental paths of training sessions on communication of innovation. The Training Mobility Program and the Multiplier Event made in Turin in July 2016 made it possible to expand the sharing of the results to a target of experts of education and applied research in the agro-food sector. The results of this further sharing have facilitated the declination of skills, abilities and competencies that professionals working in the company will have to develop to support their role in communication of innovation processes, redefining the thematic areas of the Training Model.

After the trainers training, provided by the University of Turin during the Training Mobility planned in F4G, centred on the Flipped Classroom methodology and the tools for the development of training programs, the maps of emerging skills areas have guided the allocation, to each project partner, of a specific area of expertise to be developed.

It's important to note that, as a methodological aspect and approach to the development of training courses, the final model of training for the acquisition of the skills in communication of innovation, oriented to the food technician and technologist, is designed as a deliverable with an incremental character. It means that, after an initial release of training units related to the different areas of key skills, is planned their experimentation in the contexts identified for each partner country of the project and later validated for the final release. The experimental contexts identified are:

- → in Italy, we recognize the experimental context of ITS Parma and Menabrea Beer company,
- ➔ in Spain, the INSTITUT DE RECERCA Y TECNOLOGIA AGROALIMENTARIES, together with the CASA MAS company guide an experimental path
- → in France, the Ecotrophelia partner is experiencing an experimental intervention of the students' education level, thanks to an international competition context to assess the impact of emerging skills in identifying paths of innovative proposals for agro-food products, developed by 16 / 18 years old students.