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Traditional Food Network to improve the transfer of knowledge for innovation

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1. Statement

Deliverable completed

2. Use and Verification of Deliverable in TRAFOON

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Contents

1 Adapted preface

In the European Union, Small and Medium Enterprises (SMEs) of the food sector are increasingly under pressure due to developing open markets, increasing demand of standardized and price competitive food products by the consumers, rising importance of large retailers, and challenges in obeying governmental regulations. This raises the risk of losing many traditional foods as well as traditional techniques of production, processing, preservation, and packaging that are applied by SMEs using regional raw materials and often have a role in the cultural identity of regions. SMEs of traditional foods must extend their skills in modern as well as competitive marketing and production techniques to comply with existing European regulations and to promote the aspects of their products related to nutrition and health.

To support traditional SMEs, FP7 TRAFOON project (www.trafoon.eu) has established a knowledge transfer network of 30 European research institutions, technology transfer agencies, and SME associations from 14 European countries by covering the value chain of four groups of traditional food products based on (1) grains, (2) fish, (3) vegetables and mushrooms, and (4) sweet fruits and olives. These food sectors are traditional, healthy foodstuffs which are essential for a balanced nutrition. Since November 2013 and until October 2016, TRAFOON is supporting European´s traditional SMEs in these food sectors to foster sustainable innovation and entrepreneurship in the sector of traditional foods for the benefit of the regions of Europe and the European consumer.

TRAFOON increases the communication and interaction between traditional food SMEs, SME associations, and research institutions to improve and increase the knowledge transfer towards traditional SMEs on different areas of influence/activities (e.g. food production, food processing, packaging, marketing, labelling, certification, stabilization of production protocols to assure food quality and food safety, legal issues), and to enable research topics that are needed by European food SMEs.

At the beginning of the project, the needs of traditional food SMEs all over Europe have been investigated and collected (Inventory of Needs, IoN). With this purpose, four questionnaires, one for each traditional food category, were developed including issues from the entire food production chain, but also

questions related to food safety and quality, and entrepreneurship & legal aspects. All TRAFOON partners contacted the identified SMEs and SME associations via email/phone/visit, extracting the relevant information for the IoN through the corresponding questionnaire. After extract the needs, SWOT analyses of the results for each TRAFOON traditional food category were carried out by country and sector.

Five multi-stakeholder workshops (MSWs) took place between September and October 2014 in Poland, Spain, Switzerland, the Netherlands and Czech Republic. In each MSW, TRAFOON partners, relevant SME associations and external specialist analysed the results of IoN for the core regions of the food category. The main objectives of the MSWs were: 1) prioritizing the needs collected in the IoN, 2) matching the needs identified in the IoN with the available transferable innovations identified by partners, 3) identifying those needs which do not require in depth research and may be solved without the development of new research projects, finding the solutions within the consortium experts, external scientists, or in collaboration with ongoing projects, and 4) identifying those needs requiring new scientific approaches to be included as recommended research lines/initiatives in the Strategic Research and Innovation Agenda (SRIA).

During 2015 and 2016, based on the results of MSWs, more than 55 Training Workshops (TWs, http://www.trafoon.eu/training-workshops/) for SMEs have been held in Europe. During the TWs, the technological, legal, or business-related solutions for these previously identified needs/demands have been transferred, where specifically trained mediators have been used to communicate these solutions in the language of the respective countries.

As additional knowledge transfer tool, a multi-lingual online Information Shop (www.trafoon.org) containing the information gathered and implemented within the TRAFOON network has been created. This free access online tool includes information (PDF files, e-books, audio and video files etc.) about innovations in primary production, processing and marketing of traditional food using regional raw materials in different languages. The Information Shop also contains databases of experts and organizations to enable potential future collaborations and SME-oriented research projects, and includes all technology/innovation knowledge transferred during the TWs and guidelines for product innovations in diverse European languages.

Strategic Research and Innovation Agenda (SRIA) For Traditional Foods

Based on the detected innovation gaps and the identified needs that require further research, and complemented by SWOT analysis of the demands of SMEs during the MSWs, TRAFOON has developed four SRIAs for the core regions of the TRAFOON traditional foods categories: (1) grains, (2) fish, (3) vegetables and mushrooms, and (4) sweet fruits and olives. TRAFOON SRIAs will inform national policy makers about future research need of traditional food SMEs, especially fostering rural development.

Additionally, a general SRIA (no product-specific) for traditional foods at European level has been developed in collaboration with the FP7 TRADEIT project. This joint TRAFOON-TRADEIT SRIA will inform the European Commission and European policy makers about future research answering the identified needs of SMEs in Europe.

2 Overview regarding Entrepreneurship and Innovation in Europe

Europe faces on-going structural challenges to its competitiveness and growth. The economic and financial crisis that set in in 2008 onwards has made evident such challenges, but has also been a catalyst for deeper analysis and new solutions. These challenges have emerged as Europe witnessed significant transformations in the last decades in an economic and social model that proved itself successful in the post-war period. Among various causes, the liberalisation of the world markets has put increasing pressure on national companies to raise the value and cost-efficiency of their products. A number of these companies were unable to do so. Furthermore, these new competitors from China, India, Brazil, and other former 3rd world countries, are also in the market for resources and energy supplies leading to changing cost structures for Europe's companies, many of which are dependent on imports for these supplies.

As a consequence the economic crisis hit the European Union hard and labour markets have yet to recover. Several years after the onset of the global financial and economic crisis, tackling unemployment is still at the top of priorities. In the European Union, approximately 4 million jobs are needed to return to pre-crisis employment levels (OECD/The European Commission, 2013). Groups such as youth, women, seniors, ethnic minorities, and the disabled face particularly high risks of being marginalised in the labour market.

Figure 1 illustrates the year-on-year employment gains and losses for the European Union for different categories of workers: permanent employees, temporary employees and self-employed workers (Eurostat, 2012). It shows that following significant growth in employment until 2007, the economic crisis eliminated nearly 20 million jobs between the first quarter of 2008 and the fourth quarter of 2010. On the other hand, it is interesting to note that the employment losses were concentrated among temporary and permanent employees and despite some periods of job losses among self-employed workers and some declines in certain countries, overall there was job creation among the self-employed over this period (European Employment Observatory, 2010).

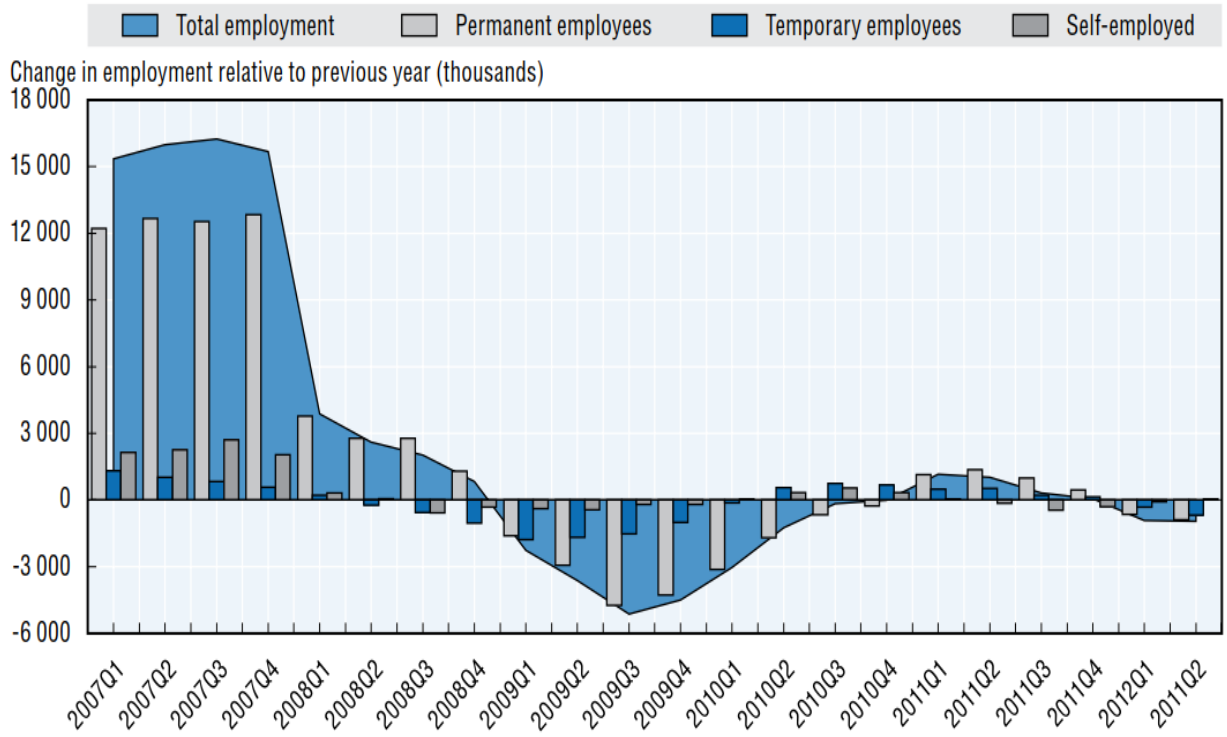

Figure 1. Change in Employment in EU27 member states relative to previous year, 2007-11

Source: Eurostat, 2012.

Unemployment rates increased in the first years of the crisis in all EU Member States except Germany and Luxembourg (see Figure below). The most dramatic increase was in Lithuania, where unemployment rose from 5.9% in 2008 to 15.6% in 2011 – an increase of more than 160%. The figure also depicts a wide variation in unemployment rates across EU member states. The unemployment rate was highest in Spain (21.8%) in 2011, more than five times the rate of Austria (4.2%) where the unemployment rate was the lowest. This gap in unemployment rates between the Member States is increasing. In 2008, the gap in employment rates between the highest (11.4% in Spain) and lowest (2.7% in the Netherlands) was 320% (of the lowest rate). This gap has grown in 2011 to 420% between Spain and Austria.

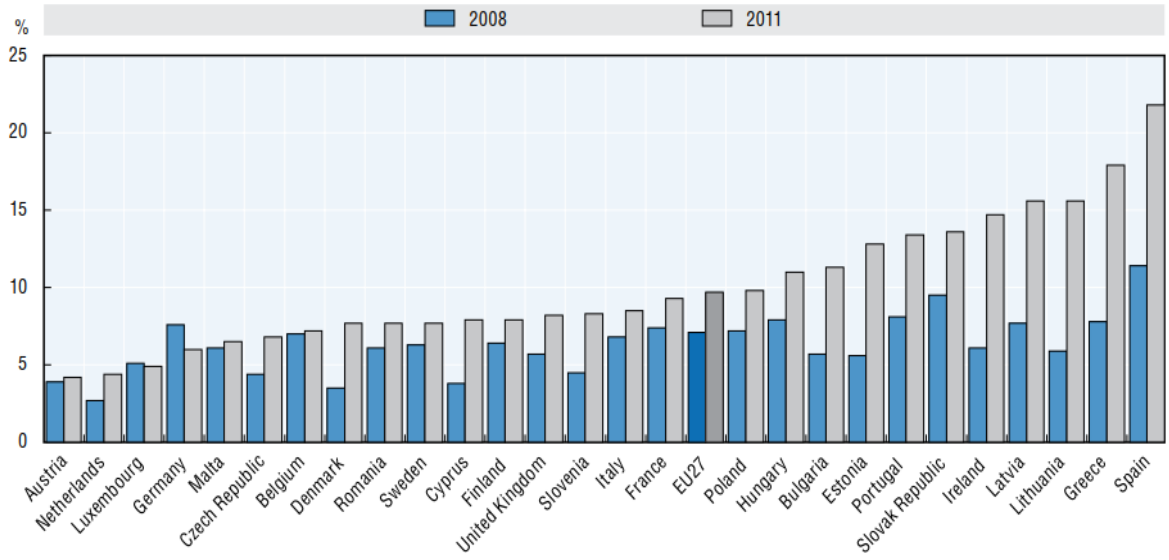

Figure 2. Unemployment rates, 2008 and 2011

Source: Eurostat, 2012.

One of the main avenues pursued by the European Commission is the promotion of entrepreneurship and self-employment (OECD/The European Commission, 2013). In its Entrepreneurship Action Plan, the European Commission (EC) sets out a clear goal: "To bring Europe back to growth and higher levels of employment, Europe needs more entrepreneurs." (European Commission, 2013). Clearly new companies, especially SMEs, represent the most important source of new employment: they create more than 4 million new jobs every year in Europe. (European Commission, 2013). Yet the engine for business creation has been stuttering. Not only is the world business environment challenging, but there is also a widespread culture that does not recognise or reward entrepreneurial endeavours enough, and does not celebrate successful entrepreneurs as role models who create jobs and income. To make entrepreneurship the growth engine of our economy Europe needs a thorough, far-reaching cultural change. As a result, the EC proposes three areas for immediate intervention:

1. Entrepreneurial education and training to support growth and business creation
2. Strengthening framework conditions for entrepreneurs by removing existing structural barriers and supporting them in crucial phases of the business lifecycle,

3. Dynamising the culture of entrepreneurship in Europe: nurturing the new generation of entrepreneurs. (European Commission, 2013)

Definitions and current situation in Europe

The OECD-Eurostat Entrepreneurship Indicators Programme, launched in 2006, has developed definitions of entrepreneur, entrepreneurship and entrepreneurial activity for the purpose of supporting the development of related indicators. The programme acknowledges the contention and different perspectives between researchers who confront this issue. It deliberately adopts a pragmatic approach based on two principles, relevance and measurability. Importantly, the definitions set out by the OECD and Eurostat emphasise the dynamic nature of entrepreneurial activity and focus attention on action rather than intentions. They are proposed to guide the collection and analysis of data sets (OECD/The European Commission, 2013):

- Entrepreneurs are those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets.
- Entrepreneurial activity is the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets.
- Entrepreneurship is the phenomenon associated with entrepreneurial activity. these definitions differentiate entrepreneurial activity from "ordinary" business activity, and additionally: i) indicate that corporations and other enterprises can be entrepreneurial, though only the people in control and owners of organisations can be considered entrepreneurs, ii) emphasise that entrepreneurial action is manifested rather than planned or intended, iii) do not equate entrepreneurial activity with the formation of any particular "vehicle", whether formal, such as an incorporated entity, or informal, although they do allow measurement to reflect particular vehicles as embodying entrepreneurial activity, and iv) although defined in the context of businesses they incorporate economic, social and cultural value created.

The Global Entrepreneurship Monitor (GEM) stands as a main authority on the analysis of entrepreneurial activity across multiple phases of the business process; the characteristics, motivations and ambitions of entrepreneurs; the attitudes societies have toward this activity; and the quality of entrepreneurship ecosystems in different economies. Sixty-two economies

participated in the 2015 survey. The report features a detailed review of key entrepreneurship indicators. Overall, this group of indicators may be viewed as a dashboard representing a comprehensive set of measures that collectively contribute toward the impact entrepreneurship has on a society and the extent society supports this activity (Kelley, Singer, & Herrington, 2016).

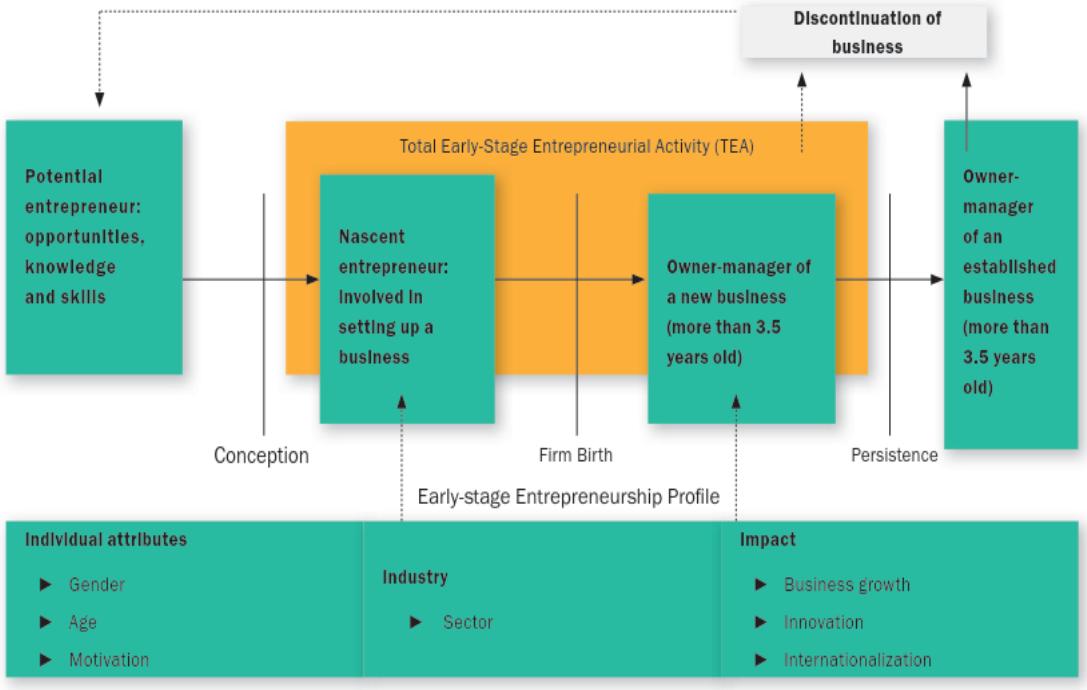

Figure 3. Model of Business Phases and Entrepreneurship Characteristics Represented in GEM

Entrepreneurial activity encompasses multiple phases of the business process (nascent, new business, established business, discontinuation), potential impact (job creation, innovaion, internationalization), and the type of activity (Total Early-stage Entrepreneurial Activity (TEA), Social Entrepreneurial Activity (SEA) or Employee Entrepreneurial Activity (EEA)).

In the following paragraphs, Entrepreneurship is briefly characterized in Europe. The information is drawn from The Gallup Organization, 2009 and Kelley, Singer, & Herrington, 2016.

I. **Self-perceptions about entrepreneurship** - personal perceptions about entrepreneurship may influence whether one would consider

starting a business. While factor-driven economies are characterized by high opportunity and capability perceptions, efficiency-driven economies and, especially, innovation-driven groups exhibit lower levels on perceived opportunities, perceived capabilities and intentions. More distinct in the innovation-driven group, though, is the dramatically lower intentions to start a business. Consequently, although people in the innovation-driven economies generally see opportunities, perhaps because these opportunities are visible or because people are alert to them, comparatively few intend to pursue entrepreneurship.

Two-thirds of EU citizens who were not (yet) self-employed felt that becoming self-employed in the next five years was unrealistic. Several Nordic countries were among those with the highest proportions of respondents who felt that becoming self-employed was realistic; in China, 49% of respondents thought this was a possibility compared to just 12% of Japanese.

The innovation-driven economies are also distinct in citing a higher level of exits due to sale, retirement, pre-planned exit or the pursuit of another opportunity. These reasons may be considered as resulting from a choice made by an entrepreneur, while other reasons may push an entrepreneur to exit. Both the efficiency-driven and innovation-driven economies show four times the proportion of exits due to bureaucracy compared to the factor-driven group. Lastly**,** the innovation-driven economies are less than half as likely as the other two development stage groups to name finance problems as a reason for business exits.

According to a 2009 survey (The Gallup Organization, 2009), EU citizens who preferred to be an employee were most likely to give reasons related to the security of employee status to explain their choice for this type of employment. Four in 10 respondents referred to a "regular and fixed income" and 35% mentioned "stability of employment". Other factors mentioned were "fixed working hours" (16% of EU citizens mentioned this) and "protection by social security and insurances" (13%). Other EU citizens mentioned certain constraints of self-employment as a reason for preferring employee status – nonetheless, each one of these reasons was mentioned by less than 10% of respondents: lack of finances for self-employment (7%), the "severity" of the decision to become self-employed (7%), fear of the legal and social consequences if the venture failed (6%), lack of the necessary skills to be self-employed (5%), fear of having problems with authorities/bureaucracy (5%) and lack of an appropriate business idea (4%). About a quarter (23%) of EU citizens who preferred to be an employee gave a reason other than the ones listed; some of these

respondents, for example, said they preferred to be an employee because that would lead to less responsibilities, risks, worries or stress

II. **Motivation for early-stage entrepreneurial activity** - most entrepreneurs around the world are opportunity-motivated. Even in the innovation-driven economies show a higher proportion of opportunity-motivated entrepreneurs, at 78%. A large difference can be seen in the innovation-driven economies, where there are more than three times as many improvement-driven opportunity entrepreneurs (IDO) as necessity-motivated entrepreneurs (NO). Switzerland, Norway, Sweden and Luxembourg–have over five times as many IDO entrepreneurs as NO. By comparison, in another European economy (Macedonia) only half as many entrepreneurs are IDO versus necessity-motivated. Among the economies participating in the GEM survey in 2013, 2014 and 2015, Poland and its southern neighbour Slovakia have shown year-on-year increases in their motivational index. Spain, hit hard by the 2007–2008 recession, has also seen improvements in the balance of IDO relative to necessity entrepreneurship.

III. **Gender and age distribution of early-stage entrepreneurial activity -** in a broad sense, women are less likely than men to engage in entrepreneurship, but when they do, they are more likely to do so out of necessity. This differs greatly, however, around the world.

IV. **Age distribution of early-stage entrepreneurial activity -** The overall age pattern for entrepreneurship shows the highest participation rates among the 25–34 and 35–44 year olds, people in their early and mid-careers. This perhaps reveals the ambition of young people, particularly those who have accumulated some experience, networks and other resources that could be of value in starting a business. At the same time, they may be early enough in their work career that they have not yet reached high positions or salaries that compel them to remain in jobs as employees.

V. **Industry sector participation -** the greatest distinction in industry participation among the regions lies in the high level of wholesale/retail activity among entrepreneurs in Africa, Asia and Oceania, and Latin America and the Caribbean, and the emphasis on knowledge and service-based industries in Europe and North America. In contrast,

technology and service activities are most common among entrepreneurs in the innovation-driven economies. Sweden and Belgium report the highest level of information and communications technology (ICT) entrepreneurs (13% for both). More than 15% of entrepreneurs operate professional services businesses in Israel and a number of European countries (Norway, the Netherlands, Switzerland, Luxembourg, United Kingdom and Sweden). Finance is most predominant among entrepreneurs in Slovakia and Luxembourg (11% and 9%, respectively). Finally, over one-four of entrepreneurs in Germany and Switzerland operate service businesses in health, education, government and social concerns. Overall, this analysis of industry sectors demonstrates the regional and development level diversity of entrepreneurs around the world and Europe specifically.

VI. **Innovation** - Innovation represents newness to a market and within an industry. GEM thus assesses the extent entrepreneurs are introducing products or services that are new to some or all customers, and that are offered by few or no competitors. Average innovation levels increase with development level. With greater participation in information and communication technology, and professional and other service industries, coupled with higher levels of education and greater access to advanced technologies, entrepreneurs may have the means to be innovative in the developed economies. In addition, many developed economies are characterized by crowded competitive spaces and markets accustomed to advanced solutions; entrepreneurs may need to introduce novel solutions in order to compete successfully. In some economies, innovation levels exhibit a trade-off with TEA, where some economies with high levels of TEA have low innovation levels, while others show the opposite result. In three innovation-driven European economies (Belgium, Switzerland and the United Kingdom), few people are starting businesses, but those who do are more likely to state their products or services are innovative.

VII. **Entrepreneurial Employee Activity (EEA**) - In the innovation-driven economies many people start businesses for their employers. While the presence of employee job options may decrease start-up activity in these developed economies, entrepreneurship may move into existing organizations. Norway shows an EEA rate of nearly 10%. The United Kingdom is also among those with high EEA rates. EEA may be seen as a trade-off with TEA, where people tend to be entrepreneurial in either context.

VIII. **The Entrepreneurship Ecosystem** - An entrepreneurship ecosystem represents the combination of conditions that shape the context in which entrepreneurial activities take place. GEM assesses the following entrepreneurship conditions: financing, government policies, taxes and bureaucracy, government programs, school-level entrepreneurship education and training, post-school entrepreneurship education and training, R&D transfer, access to commercial and professional infrastructure, internal market dynamics, internal market burdens, access to physical and services infrastructure, and social and cultural norms.

The entrepreneurship ecosystem is strongest overall in the innovation-driven economies, while the factor-driven economies struggle with the least favourable entrepreneurship conditions. Physical infrastructure exhibits the largest variation between economic development levels. Differences are also visible in government entrepreneurship programs, which average 3.9 in factor-driven economies and 4.7 in innovation-driven economies. Alternatively, ratings for post-school entrepreneurship education and internal market dynamics showed similar averages across all development levels. Among the individual economies, a few stand out for high ratings across the majority of entrepreneurship ecosystem indicators. In Switzerland, 11 out of 12 conditions exhibit among the 10 highest values in the sample. The Netherlands has 10 such highly-rated conditions, Luxembourg has 7. One condition—cultural and social norms—shows high ratings in economies from all development stages: the 10 most highly rated economies are those from the innovation-driven group (Israel, USA, Canada, Switzerland, Estonia), the efficiency-driven group (Lebanon, Ecuador, Indonesia, Malaysia) and the factor-driven group (Philippines).

The level of entrepreneurship can be influenced by two set of factors (Bolzini, Carli, Fini, & Sobrero, 2015):

- Supply-side factors, i.e., individuals with capabilities and preferences to initiate a business.
- Demand-side factors, i.e., the availability of business opportunities.

Both demand-side and supply-side factors are relevant in determining the success of entrepreneurial outcomes.

The rationale for policy interventions to sustain entrepreneurship lies in the existence of distortions and market failures on both the supply and demand

sides. Policy interventions on the supply side favour the motivation and skills of entrepreneurs, as well as a conducive framework for entrepreneurship, such as the existence of capital availability, training and education provision, and access to a network of business partners, researchers, suppliers, etc.

Demand-side policies should strive to increase the number and quality of opportunities for entrepreneurial activities. In this regard, interventions can support the exploitation of technological and market opportunities, technological advancements, and investigation of latent market needs.

Entrepreneurship on the traditional food sector

The Traditional Food Sector is characterised by a number of idiosyncrasies, which clearly sets it apart in terms of entrepreneurship dynamics. First of all, traditional food producers are mainly established in rural areas, where a tradition of entrepreneurship, and particularly, high value added entrepreneurship, is not customary. On the contrary, there is frequently a family-business culture that hinders the creation and development of new businesses.

Secondly, the same areas and entrepreneurs have in general a lower than average level of education, placing considerable barriers to innovation and business sustainability in a global world.

Thirdly, as in the general food sector, it is a greatly fragmented industry, accounting for a high number of SMEs. This factor has far-ranging consequences. SMEs show low R&D capabilities, and dependence on public R&D institutions, and lower technology absorption levels compared to large companies. There is also lack of attractiveness and visibility to venture capitalists that impedes the capacity to fund novel projects. Traditional food entrepreneurs are therefore unable to fund their diversification of the start-up risk, the accumulation of start-up capital, or the financing of growth and expansion attempts. Furthermore, the sector in Europe is mostly dominated by very large retail oligopolies, which remove the market influencing decisions out of the small and medium sized companies.

Fourthly, Agri-food SMEs lack appropriate tools for responding to increasing market regulation and competition. Despite governments' calls for the industry to become more innovative and updated practices and procedures and companies' acknowledgement of the importance of product and process innovation and their engagement in these activities, several aspects of innovation remain linked to companies' age, size, and regional location (Avermaete et al., 2003, *in* Bolzini, Carli, Fini, & Sobrero, 2015).

Finally, as already stated, policy liberalization and the opening-up of new, very large, markets have also caused some significant transformations within the agri-food sector, adding complexity to the agri-food value chain, generating new management and commercialization models, new forms of innovation and new business models (Bolzini, Carli, Fini, & Sobrero, 2015).

3 List of needs

Identified Common Needs

To analyse the current situation, relevant finalized FP6/7 projects were analysed[1], as well as an inventory of need based on a number of questionnaires, and Multi-stakeholders workshops. Deliverable 7.2 included the results of the discussion and analysis of the Inventory of needs (IoNs) of the different countries involved in the Multi-stakeholders Workshops (MSW) concerning the topics related to WP7: Fostering Entrepreneurship (Marketing, Labelling, Legal aspects, Certification, Technology Transfer & Education, Entrepreneurship). The following paragraphs summarize its main conclusions for each of the Trafoon food categories.

- Grains

Identified needs were mainly related to Marketing. Owners stated a need for marketing know-how in order to better attract consumers and present their products. Acquisition of knowledge was required on how to include and spread information about health benefits, allergenic content and type of production, among others. For this they have identified the need to have further information on labelling and packaging identifying the different regulations in EU and non-EU countries as well as the legal aspects prevailing in each country. An additional stated need is the certification of products and raw materials according the EU schemes known as PDO (protected designation of origin), PGI (protected geographical indication) and TSG (traditional specialty guaranteed) that promote and protect names of quality agricultural products and foodstuffs.

- Fish

Identified needs were also related mostly to Marketing, Labelling, Legal Aspects and Certification. SME owners stated a need to improve the commercialization of their products and a need to increase marketing skills and knowledge. Traditional fish products must be advertised on their health aspects and properties, like Omega 3 fatty acids content that should be mentioned and

[1] Trafoon Deliverable 7.1 List of finalized projects (national, FP6&7) on fostering entrepreneurship and SME development for traditional food producing SMEs available.

explored in a more profitable way. The labelling and the certification of fish products, PDO (protected designation of origin), PGI (protected geographical indication), TSG (traditional specialty guaranteed) and organic certification were also desired issues that needed further exploration.

The differences in regulations in EU and non-EU countries, and the difficulties that arise for commercialization of fish products, leads to a requirement to increase the knowledge of these regulations, in all countries, and the labelling demands associated.

Another identified need is related to the necessity to increase the value of traditional products. The know-how on the development of new products, based in traditional techniques or raw materials/products, is a way to improve and stimulate production and added value as well as innovation enhancement inside the companies.

- Vegetables and mushrooms

Once again stated needs were focused on Marketing, Labelling, Legal aspects and Certification. As far as marketing is concerned there was a clear need to promote the products developing more environmentally friendly, stylish and trendy packaging improving the marketing strategies used and relating them with a healthy life style, removing the reputation for polluting the environment with pesticides and wasting too much water for irrigation. Also the advertisement of health properties should be increased and related to the new market trends associated with consumers demand for more non-traditional food and fast food.

On labelling, there was a perceived need to link and advertise health benefits and properties. There is lack of scientific information on health and nutritional properties. Organic labelling was also and identified issue.

On legal aspects, SME owners stated the need to meet environmental protection, phytosanitary requirements, standards for endotoxins and other compounds, EU standards as well as HACCP implementation, which are frequently difficult to understand and implement. The translation of all these procedures is needed in order to better address legal requirements and improve quality and security of final products.

On certification, there was a perceived difficulty, and associated costs, to obtain patents for the genetic improvements, and a lack of confidence in their value.

- Sweet fruits and oil and olive oil

As far as marketing is concerned the stated needs were mostly associated with packaging and advertising and the necessity to reduce the diversity of packages in terms of number and used materials.

On labelling, it was believed that there is a need to reduce the diversity and the number of labels. In both cases it is necessary to standardize or to develop patterns for the commercialization of the products inside each country, inside EU and to export them.

Regarding legal aspects, harmonization of legislation between countries and the number and type of certifications needed for trading were stressed. On the other hand certification of products of fruits according the EU schemes known as PDO (protected designation of origin), PGI (protected geographical indication) and TSG (traditional specialty guaranteed), organic certification and patenting of products was also an issue deemed important insofar as its complexity, time needed and costs are concerned. SMEs need help to understand these processes and its steps.

Regarding entrepreneurship, on the one side, there was a lack of competences and knowledge to develop new products based on traditional ones or raw-materials, and on the other side, a lack of knowledge and deeper understanding of the markets and companies' needs and requirements. Thus there is a need to approach these two worlds and their goals, namely by promoting cooperation between SMEs and researchers.

Identified Needs from Global Trends

Besides entrepreneurs' perceived needs, anticipating, understanding and responding to consumer trends is a major competitiveness playing field. In fact, beyond global changes that have affected competitiveness of European SMEs in the field of traditional food, there were also a number of changes in the way consumers approach food, what choices they make, and what they expect from it, namely in terms of quality, variety, safety, convenience and price.

Identification of the key trends of the agri-food sector becomes essential to understand the options that can be taken by the companies to meet the challenges they represent and thus be able to explore new market niches or improve its position in the international markets. New consumer trends range from dietary restrictions or preferences, sustainability concerns, new technology on distribution and commercialization, and increasing market segmentation.

The following trends can be observable in 2016[2]:

1. **"Food under Pressure"** – consumers are increasingly aware of the relationship between food, health and wellbeing, and are taking buying choices accordingly. There are also additional pressures from special interest groups such as athletes, the elderly, children, people with food intolerances or other pathologies; as well as new regulatory frameworks, that put an emphasis on public health restrictions. There is as a result an increasing pressure for further communication and packaging transparency, and replacement of artificial ingredients by more natural alternatives. In the range of new products launched in the market, "clean label" products have increased their presence in the supermarket shelves.

2. **"Commitment to Sustainability"** – consumers are willing to pay more for products with environmentally-friendly or ethical positioning. Sustainability is a current commitment of the agro-food industry, whereas eco-innovation is placed as a corporate value / strategic axis. In some countries, sustainability is a strong catalyst for new product development.

3. **"Alternatives for All"** - focus on communication of the missing ingredients, as opposed to other benefits of the product (ex. Gluten-free, Lactose-free). There is also a trend to use alternative products to allergen prone ingredients, such as quinoa. For example, gluten-free products have experienced substantial growth. Target audiences are not only those who suffer from gluten intolerance but also the families, the people who perceive the products as having health benefits or gain-loss properties. On the other hand, lactose intolerance has led to the appearance of alternative "milks", such as rice milk, almond milk, soya milk, etc.

4. **"Flexitarians"** – vegetarian consumers still represent a minority (albeit increasing). However, there is a rising percentage of consumers that have chosen to reduce meat consumption, for matters of health and reduced impact on the environment. As a result, 1/3 of Europeans are

[2] (Cruz, 2016)

actively reducing their intake of meat, and especially red meat. In Italy, 38% of consumers are "meat avoiders"; 33% in France and Germany. The "flexible vegetarians" are more demanding than vegetarians and vegans, as they usually look for products with betters taste, and add other properties to their demand: health and well-being, protein source, ethics and environment, and food safety. As a result, alternatives to meat has doubled between 2011 and 2014.

5. **Green light for vegetables –** most consumers recognize the need to increase vegetable introduction in the diet, however, they are usually put off by the lack of flavour, in comparison to other less healthy meals. The industry has seen this unsatisfied desire as an opportunity to launch new products that introduce vegetables in atypical food products. Examples such as fruit snacks and vegetable smoothies have reached a high level of success. In these products, vegetables are actually regarded as an added value. Instead of the exception, R&D of new vegetable-based products are increasingly the norm. The R&D trend is growingly towards exotic combinations of vegetables or fruit.

6. **"Genuine connections"** – product commoditization has led to an added interest in getting to know and creating a genuine link to the production process and origin. Consumers have a preference for products that communicate "real", "local" and "crafted" qualities. Brands have responded by centring their marketing efforts on communicating the history, the background and the source of the product, hoping to establish a trusted link between the producer and the consumer. These efforts emphasize the experience, giving excitement and confidence to the consumer on the origin, process, who produces and who distributes. This is made especially evident in the growing presence of protected designation of origin (PDO), protected geographical indication (PGI), traditional specialty guaranteed (TSG), and Organic certification products in the supermarkets.

7. **"Focus on technology"** – increasingly concerned with artificial resources and production processes, consumers prefer "authentic" and "natural" production methods. The brands are communicating the manufacturing process, with an added emphasis on manufacturing processes perceived as natural, such as fermentation and pasteurization.

Modern processes need to focus communication on key points to achieve a good consumer acceptance.
Technology has also impacted commercialization. Online shopping, smartphone applications, delivery services are changing the way consumers access their shopping, and producers distribute their goods and services. The disruption is taking place across the board from niche markets to complete meals. Innovations have encouraged consumers to think outside conventional retail circuits.

8. **"Proteins – beyond athletes" -** Introduction of products with claims of protein enrichment is becoming a fast trend, even in inconspicuous products such as snacks and bread. As a result sport nutrition brands have seen their markets open, supported by products underpinned in "healthy living" concepts.

9. "**Alibi for indulgence**" - health-conscious consumers seek justification for the consumption of indulgent products (confectionery and desserts). As certain segments are forced to recognize that they may never be able to market other type of positioning, the focus has been to strengthen the premium and indulgence intelligently, despite the emerging trends in terms of health and well-being. Concerned consumers about health issues are looking for justification to indulge in a certain type of products. They opt for ingredients that are perceived as healthier or more natural, even though they still possess high levels of fat, sugar or salt. Properties such as "naturalness", fair trade or high-value ingredients (ex. Omega-3) work as alibi for premium product consumption.

10. **"Exploring the 5 senses"** - new gustatory experiences including new textures, shapes and bold flavours. Consumers expect more authenticity and originality in food. New taste experiences include new textures, shapes and bold flavours are today the subject of research and development. Intense intense sensory experiences give "life" and a deeper meaning to products and brands.
Flavour has been the focus of innovation. However, increasing consumer demand is also reflected not only in the pursuit of savoury meals but also attractive and expectant innovations. Taste has been the focus of innovation. But the growing consumer demand is reflected not only in the search for tasty products but requires attractive and expectant

innovations. The industry should invest in vibrant colors, shapes, packaging and
creative messages to capture the consumer's attention. Emerging in diverse geographic areas, innovation in visual appeal of packaged products is a potential tending to revolutionize the world through bolder choices.

3.1 Responding to new consumer behaviour and food choices

3.1.1 Challenge

- Meeting the needs of individual target groups (special needs groups, healthy lifestyles, food restrictions, etc.), in terms of adequate food products and services, on the basis of a Customer Needs Analysis.
- Developing new production, storage, distribution and preparation processes to maintain positive health benefits.
- Developing convenience, fast food and vending food to offer a balanced nutrition.
- Promoting awareness and facilitate healthy food choices.
- Establishing regulatory frameworks that facilitate practical foodstuffs, while ensuring the health of consumers is upholded.

3.1.2 Scope and Expected Impact

- Improvement of knowledge of consumer preferences, specifically market niches connected with rising trends in healthy lifestyles.
- Increased knowledge on nutritional properties.
- Risk-benefit evaluation of food products, considering full production lifecycle.
- New dietary models and ingredients, and corresponding risk-benefit evaluation.
- Increased knowledge and new research of diets, food and sources that contribute to decreased levels, or alleviation, of chronic diseases (cardiovascular diseases, diabetes, etc.).
- New research of food ingredients and products which may alleviate typical elderly diseases, such as osteoporosis.
- Increased knowledge of the relation between food and intestinal well-being, namely regarding gastrointestinal flora / bacteria.
- Linkage of research project, nutritional claims and consumer expectations.

- Development of guidelines to new practical and convenient products: pre-prepared, ready-to-use for home and restaurant.
- Improvement of nutritional and pro-commercialization properties of functional food (taste, smell, colour, etc.), such as probiotic food and foodstuffs.
- Design of consumer environment to facilitate healthy food consumption.
- Redesign of food products.

3.2 Increase industry sustainability

3.2.1 Challenges

- Ensuring energy efficiency in food production, distribution, commercialization and waste management.
- Studying regulatory frameworks for energy efficiency in food production.
- Facilitating, promoting and materialising local sourcing of ingredients in European food production.
- Guaranteeing / improving confidence on European food products, and particularly organic, fair trade
- Improving image or confidence of industrial production methods.
- Establishing new ways of cooperation and communication between agriculture, the food industry, the retail trade and the catering trade.
- Facilitating collaboration between companies, researchers, and other players.

3.2.2 Scope and Expected impact

- Increased full lifecycle knowledge.
- New methods or tools for the evaluation of environmental impact of food.
- New methods or tools for the evaluation of the social impact of nutrition.
- Collaboration projects with farmers for increased efficiency, quality and quantity of foodstuffs, as well as fair pricing.
- Development of new value chain-based frameworks for energy conservation as well as waste prevention.
- Development of high-efficiency food production processes, while maintaining quality and safety standards.
- New water, energy, and other non-renewables efficient technologies.
- Added research on de-intensify food production systems, and subsequent impact on product pricing and efficiency.
- Impact of present and expected climate change effects.

- Re-usages of food production by-products / waste.
- More sustainable processes for food preservation.
- New forms of biopackaging.
- Analysis of production constraints on the European food industry.

3.3 Increasing value of traditional products for competitiveness and innovation of SMEs

3.3.1 Challenges

- Introducing open innovation in traditional sectors.
- Incorporating High Technology in low-tech sector.
- Transferring new knowledge and new technologies in a framing of local gastronomic traditions.
- Maintaining competitive advantages through incremental innovations in products and manufacturing processes, while maintaining character, authenticity and quality.
- Adaptation of existing specialities to the requirements of the national / international market, while taking care to retain their typical character.
- Streamlining best production, distribution and commercialization practices of traditional foods.
- Investigating, defining and determining foreign requirements to perceived European or individual Member States "character", and market / develop new products that fit the requirements based on authenticity and reliability / trust.
- Disseminating and guiding through protected designation of origin (PDO), protected geographical indication (PGI), traditional specialty guaranteed (TSG), and Organic certification.
- Increasing consumer information and transparency of traditional products.
- Increasing multi-stakeholder cooperation.
- Identification of technologies where Europe is at the forefront or where it is known for.
- Identification of areas where Europe shows technological potential, or where there is a regionally-wide concerted effort, such as Smart Specialisation Strategies.
- Identification and uptake of promising research areas, and corresponding implementation of processes, products or services.

3.3.2 Scope and Expected impact

- Development of new metrics for sustainability in food production / consumption.
- Definition of additional analytical methods to describe a traditional product based on origin, authenticity, local impact, etc.
- New product development based on use and enhancement of traditional foodstuffs or livestock.
- New research into traditional production processes, raw materials, ingredients and products.
- Minimisation of the impact of food safety requirements in product quality.
- New research into market preferences and choice in traditional products vs industrial products.
- Integration and evaluation of the impact of traditional crop strains on
- Research and mainstream of new cultures, or combination of cultures, that contributes to biodiversity.
- Delimitation of product quality discrepancy.
- Investigation of the consumer reception to ethically controversial products (eg. GMO).
- Application of nanotechnology and nanoscience in food products, food packaging and food processing namely regarding nutritional or health determinants.
- Formulation, release and bioactivity of functional food products.
- New technologies for coating and packaging food products.
- New research that promotes understanding of the interaction between nutrients and the human organism.
- New dietary strategies and components.
- New research into useful bacteria.
- Information and new models for traditional food production and distribution processes.
- Development of models for personalised nutrition.
- Provision of consumer services using ICT.

3.4 Improving marketing know-how and communication strategy in SMEs:

3.4.1 Challenge

- Improving marketing advertisement of products' special properties (health benefits, allergenic content, type of production), enhancement of packaging material/design, etc., digital marketing.
- Advertisement of products' special properties (health benefits, allergenic content, type of production)
- Improving and streamlining science-based communication to the public, including evidence-based risks and opportunities (health, sustainability).
- Enhancement of packaging material/design, etc.,
- Applying digital marketing in traditional sectors.
- Increase knowledge of international markets and disseminate best market penetration guidelines accordingly, namely in the fields of safety, standardisation, health, environment, etc.
- Getting to know the needs & information behaviour
- Building a trusted relationship with the consumer.
- Creating novel packaging concepts (materials and designs) that promote re-use or recycling, minimize the overall environmental impact of food, etc., in order to make the products more attractive to consumers;
- Developing smart and sustainable packaging solutions for enhancing the exportation: extending food preservation/shelf life and maintaining food quality/functionality/safe-use;
- Establishing effective communication between all those involved in the food chain, including the authorities and inspection institutions.
- Adoption of ICT for client service optimisation.

3.4.2 Scope and expected Impact

- Delivery of training programs at SMEs to increase their awareness and knowledge regarding food labelling, legal aspects, certification and other IPR related to traditional food regulation;
- Promotion of dialogue between the industry and research centres in order to establish collaborative R&D projects (research based knowledge at SMEs);
- Improvements on the connections between SMEs producing traditional food products and tourism;

- Definition and set-up of strategic plans for traditional products valorization;
- Identification of success stories in the field of traditional food, including startups and spin-offs from other companies or from research centres; establishing a list of best practices for innovation, entrepreneurship, marketing and commercialization to be disseminated.
- Set-up of knowledge and technology transfer activities between stakeholders:
- Delivery of knowledge and technology transfer tools in SMEs;
- Identification and transfer of best practices for technology transfer and commercialization of research output across several sectors and multiple countries.
- Gained awareness of how consumer confidence can be strengthened by communication.

3.5 Enhancing awareness and knowledge of SMEs regarding quality and safety of traditional food

3.5.1 Challenge

- Enhancing awareness and knowledge in:
  - Food labelling (nutritional value, health benefits, advertisement of properties)
  - Legal aspects for environmental protection, phytosanitary certification, HACCP implementation and EU standards;
  - Certification according to EU schemes: protected designation of origin (PDO), protected geographical indication (PGI), traditional specialty guaranteed (TSG), and Organic certification.
  - Intellectual Property Rights (IPR): copyright, trademarks, geographical indications, patents, design, plant's breeder rights, etc.
- Establishing common regulations/standards: harmonization of legislation between countries and the number and type of certifications needed for trading; standardization of products' labelling (what to put in them and how);
- Recognition and evaluation of potential risks at the earliest stage.
- (self-) Proactive establishment of food safety guidelines.

- A priori establishment of solutions in crisis situations, thus ensuring consumer confidence
- Optimisation and perfection in terms of safety of production, storage and distribution procedures. Optimisation and implementation of traceability systems.
- Ensuring that Europe is leading the way in new requirements for food safety.

3.5.2 Scope and expected Impact

- Consumer perception of risk, consumer behaviour and consumer confidence.
- Early detection and characterisation of food hazards. Development of fast detection methods for pathogenic micro-organisms and their metabolic substances.
- Study of pathogenic and spoilage flora (bacteria, fungi, viruses). Development of starter cultures for the inhibition of pathogenic and spoilage flora.
- Suppression of transmission of antibiotic resistances.
- Chemical and immunochemical danger studies.
- Development of predictive and risk assessment methods and tools (both microbiological and toxicological risks and dangers) by both exposure models and safety and traceability management in a risk-benefit approach.
- Integration of comprehensive safety assessment (toxicology, side effects) into the development of new bio-active food. Development of comprehensive methods and guidelines to evaluate the risk-benefits of food.
- Prevention and management of food crises by integrating social, economic and environmental consequences.
- Integrity of the food chain including traceability.
- Validation of cleaning processes and of the hygienic design of food production lines.
- Translation of certification labels.

- Implementing training programs at SMEs to increase their awareness and knowledge regarding food labelling, legal aspects, certification and other IPR related to traditional food regulation.

3.6 Stimulating entrepreneurship and inter-organisational cooperation

3.6.1 Challenge

- Developing general training to improve the level of human capital at the firm level to equip the companies with the appropriate qualifications and change mind-sets about entrepreneurial opportunities.
- Promoting business and entrepreneurship education in school and in training.
- Stimulating intrapreneurship in established companies in the creativity, business planning, and corporate entrepreneurship areas.
- Streamlining of financial capital tools for the traditional food sector: private equity, corporate venture capital, crowd funding, business angel capital, and proof-of-concept funding.
- Promoting cross-border capital investment and business networking.
- Generating inter-business alliances to lobby, influence or change governance structures, legislation or attitudes towards the agri-food sector.
- Networking activities to share and discuss cultural differences in food perceptions and trend.
- Integrating across the board technological advances (Key Enabling Technology - biotechnology, nanotechnology, etc.)
- Promoting dialogue between the industry and research centres in order to establish collaborative R&D projects (research based knowledge at SMEs).

3.6.2 Scope and Expected Impact

- Improvement of in-house industry-relevant qualifications.
- Increased entrepreneurial knowledge and skill, positive perceptions of entrepreneurship, and intentions to start a business) and on entrepreneurship outcomes (i.e., nascent and start-up behaviours, financial success).
- Raised awareness of the opportunities for venture creation, by means of short courses and EU-level boot-camps intended for academics,

students, and the employees of technology companies who wish to start their own business or to commercialize the results of their research
- Stimulation of intrapreneurship and intra-business interactions, support, and guidance.
- Availability of adequate financial capital for the traditional food sector.
- Provision of peer support and motivation to entrepreneurs, and examples or role models;
- Provision of expert advice and counselling.
- Enactment of changes in government procedures or legislation.
- Increased access to opportunities, information, and resources in the region.
- Initiatives to support internationalization of businesses.
- Increased levels of R&D investment and technology transfer.
- Diversification of technology transfer activities away from universities/big-science laboratories and business relations
- Matchmaking events between companies and intellectual property owners or other technological opportunities.
- corporate venture capital into start-ups that present interesting technological
- opportunities to be acquired by existing business units.
- Sharing of technological or managerial knowledge and tangible resources.
- Investments in knowledge sharing through national and international.
- Improvement of connections between SMEs producing traditional food products and tourism;
- Increased understanding and policy making based on the role of clusters, incubators, accelerators, science and technology parks, etc. as catalysts of traditional food sector and regional growth via SME creation and development.
- Share of facilities or laboratories between companies, on same or similar research topics.
- Provision of incubation facilities, where entrepreneurs can receive management and legal advice, finance channels, industry know-how and access to new markets.
- Development of market for ideas or dedicated platforms.
- Creation of innovation brokers between companies and R&D producers.
- Establishment of mutually beneficial cooperation through matchmaking events.

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