Thematic Smart Specialisation Platforms for Agri-Food / Industrial Modernisation

Expression of interest for the development thematic sub-areas
Fields marked with * are mandatory.

EU regions and member states are invited to propose a thematic area that is of their interest and it is linked to agri-food or industrial modernisation and their smart specialisation strategies (RIS3), and in which they wish to collaborate on with other regions or members states in perspective of starting a partnership for co-investment in the development of new value chains.

Submissions are welcome from one region or a group of regions which are keen to act as coordinating/leading region(s).

To submit your proposal, please fill in the survey below.

**Title of proposed subtheme/focus area**
European Agri-Food Partnership on Nutritional Ingredients

* Please indicate the most relevant Thematic Platform for your proposed area:
  - Agri-food
    - Industrial modernisation

* Your Name
Sophie

* Your Surname
Bourez

* Region / country
Wallonia (Belgium)

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Project Manager

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*Description of the proposed subtheme/focus area*

Global health problems call for a need for products that fit in a balanced diet and lifestyle. This opens opportunities for both inherently ‘healthy’ products like fruits and vegetables, as well as ideas for new ingredients and alternative food sources. The partnership will also exploit the local, both terrestrial and marine, biodiversity as a source for food products and ingredients. With these novel ingredients, we can improve the nutritional quality and increase the diversity of the western diet (focus on, for example, unhealthy or unbalanced diets in the EU – fat rich, sugar rich, fiber poor, etc.). New nutritional insights can also answer the consumers’ demand for a more individual approach towards personalized diet.

The aim of this proposal is to develop an interregional partnership between agri-food actors (industries, academics, cluster organizations and relevant research and technology organizations (RTO’s)), facilitating the cross-over of innovation in the field of nutritional ingredients, stimulate cross-sectoral collaboration and accelerate the development and commercialization of novel and/or improved ingredients. The partnership will build on an interregional database composed of multiple entries, in which consumer trends and habits over the globe as well as major market trends will be registered (first entry), allowing the partners of the partnership to identify subjects of interest for their core activities or for potential new business developments. After discussion and confirmation of new trends, business cases, or process/product developments, partners will define their intention of development of new ingredients/additives as a new project and will benefit from the "technology network" available in the database (second entry) in order to identify the existing pilot plants throughout partner regions. This will eventually lead to the identification of investment opportunities for economic actors as missing technology at pilot or industrial scale will be detected. Altogether, this partnership will promote interregional collaboration between a diversity of partners and strengthen competitiveness of industries in their aim to better respond to specific consumer demands emerging from the market. This partnership thus offers the unique opportunity for interregional demand-driven innovation in the field of nutritional ingredients.

* Are you involved in the design and/or implementation of research and innovation strategies for smart specialisation (RIS3) in your region/Member State? Please explain.

**Wagralim**: The Walloon Region has redesigned its Policy Mix in 2015 in order to fit with the S3 strategy requested by the European Commission. This strategy is based on six Competitive Clusters covering the following areas: Biotech and pharma (Biowin), Mechanical Engineering (Mecatech), Aerospace industry (Skywin), Logistics (LiW), Green chemistry and sustainable construction (Greenwin), and Agro-food industry (wagralim). In addition, several instruments have been reorganized to support this strategy and to increase the regional coherence with the 6 competitive clusters (e.g. Creative Wallonia, Agency for Enterprise and Innovation, Plan Numérique).

Each Competitive Cluster is aiming at connecting the building blocks of its value chain and creating value through focused and collaborative R&D projects, training programs to improve managerial and innovation related competencies, and building bridges with other European or non-European Regions or countries. Altogether the 6 Competitive Clusters represent a network of more than 800 companies, connected with universities and research centers. They support the implementation of the S3 strategy through the above cited mechanisms (collaborative R&D, training and internationalization) and the following core activities:

- Developing the cluster network and offering innovation related services
- Identifying the best technological building blocks
- Pushing the adequate innovation processes to companies
- Orienting R&D projects to market valorization (ideation, development, prototyping, commercialization)
- Connecting the network to international networks and value chains

Wagralim is one of the six Competitive Clusters and is dedicated to the agri-food industry. The Cluster has defined 3 strategic domains: nutrition and health, industrial efficiency, sustainable agri-industrial chains. The cluster is active on the long term and short term technological innovation, managerial innovation, Industry 4.0 implementation and is developing a user (customer) centered approach. Wagralim has mobilized more than 95 million euro (public-private) through 42 collaborative projects. The cluster is a founding member of the European Food Alliance and coordinating a Cluster Go International program (COSME) “New Frontiers in Food”. In this way, wagralim is heading the third industrial sector in size (added value or employment) forward by reinforcing its best champions with their regional and international value chains.

Contact: Sophie Bourez (Project Manager)
www.wagralim.be

* Please explain the transformative nature of your proposal. What are you aiming to achieve?

The aim of this partnership is to connect consumer and market needs efficiently to technology developments, relying on well selected raw materials (e.g. new types of grains, re-introduced forgotten crops raw product taking agri-ecological and nutritional considerations into account) and state-of-the art analytic and processing technologies. The partnership will help the industry to become more agile to respond swiftly to emerging consumer needs for a better nutrition and personalized nutrition.

In Europe, the agri-food sector is mainly a SME driven sector. This is also true for companies focusing on the production and commercialization of new ingredients. These companies have limited capacities for innovation, while exactly this is needed to adapt quickly for the production of new raw material and ingredients. Most of the time they rely on a limited set of technologies available internally or in their direct regional environment.

The partnership will help those companies to access a broader spectrum of technologies and equipment in Europe, and support them in the industrial implementation of new raw materials and processing technologies. They will have a better knowledge and overview of existing and recently developed equipment and technologies ((green) extraction, fermentation, bioconversion, downstream processing (purification, homogenization, formulation, etc.), gentle drying or heating techniques, encapsulation etc.). Companies will also benefit from the network effect to confirm fast evolving market trends and make the right strategic choices for their further development and investments.

To summarize: the partnership will facilitate the cross-over of innovation in the field of nutritional ingredients, stimulate cross-sectoral collaboration and facilitate the development and implementation of novel and/or improved ingredients. This will also lead to the identification of investment opportunities in missing/new technologies that are necessary to produce and/or implement these new ingredients. New equipment for pilot facilities can also be detected and lead to investments in these facilities.

Altogether, this partnership will promote interregional collaboration between partners and strengthen competitiveness of companies in their aim to better respond to specific consumer demands emerging from the market. It offers a unique opportunity for a region to benefit from success stories in other regions, sharing best practices, and benefit from commercial networks of involved partners. Cross sectoral collaboration will be important in this partnership as economic actors coming from various sectors would work together interregionally on the development of a new ingredient (equipment suppliers, technology providers, raw material producers, final product developers, etc.).
* Please detail main challenges in relation to your proposed sub-area that may be addressed through interregional collaboration.

The very first challenge is to collect and interpret consumer demands and trends observed in the regional markets by strong and local cluster organizations, living labs, key opinion leaders and industry players (both B2C and B2B companies). These consumer trends will be classified in several functional and nutritional challenges that can be met by specific ingredient categories (e.g. prebiotic fibers, protein enrichment, polyunsaturated fatty acids, nature-based texturizers, clean label ingredients, natural aromas, flavors, colorants etc.). The classification will help to match with the existing competencies and commercial interests from actors in the different regions.

The second challenge consists in the identification of the most promising innovative ingredients, taking economic, ecologic and social sustainability into account. To tackle this challenge, the innovation players will i) rely on existing sources (e.g. agricultural crops) that can be used as source of ingredients, ii) identify minor or new crops that can be included in the agricultural system and generate new solutions for the market, iii) or look at side-streams available in the industry that can be valorized in a circular economy loop. Other trending categories such as fermentation products, macro- and microalgae, insects and others should be taken into consideration as well.

The third challenge consists in the set up and elaboration of the adequate innovation chain in the involved regions. Based on a cross-over principle, a specific innovation group will be set up for each main nutritional challenge identified, including both industry and RTO’s. These innovation chains will be activated or combined to tackle every new consumer trend observed in the interregional space. Any interested company could manifest interest in one of these innovation chains to lead the idea to a commercialized product on the market. Several types of sectors (chemistry, bio-economy, etc.) and disciplines will have to be combined (consumer analysis, extraction and down-stream processing technologies, nutritional science, biotechnology, etc.).

The fourth challenge is to build a strong technology network to support the development of innovative ingredients for a selected category or functionality that has to be developed to respond to the detected consumer/market demands. This technology network will be transregional and map all available pilot centers or technological facilities over the partner regions. This exhaustive mapping will also allow the identification of “gaps” - missing equipment or pilot plants - opening the floor to interesting investments opportunities for the partners. The companies involved in our partnership would have preferential access to this technology network to perform pilot tests in order to develop and commercialize their targeted new nutritional ingredients.

The fifth challenge is related to data management through the set-up of the database and its maintenance. Besides the typical attention points to be addressed, related to data management, a specific challenge concerns confidentiality and access to information. Regions and partners will have to agree on a clear and strong governance system to avoid leaks, loss of intellectual or industrial property, and to meet the evolution of the legislation regarding to data management (new legislation coming up in 2018).

Taken altogether, this interregional partnership on Nutritional Ingredients will give a strong competitive advantage to industries that are active in the sector of nutrition and health by helping them in the development of the extensive range of products they will have to tackle to better respond consumer needs.
* Please indicate any commitment and political support (regional/national level) for this proposed sub-area. Please also indicate approximate amounts and sources of funding to be provided during a period of at least 2 years.

The theme is full part of the Walloon S3 priority areas (Health and food priority), and as a consequence is treated as a priority in research and innovation funding. It is notably developed as a strategic domain of wagralim (healthy food and nutritional quality). Moreover, the Walloon region provides its full support to our initiative as shown in the Letter of Support they delivered (see LoS_S3P Agri-food Wagralim_Walloon Region - Belgium.doc).

The Competitive cluster policy as a whole (6 clusters) benefits of a budget of 642 million € for the 2015-2019 period (for research, development and innovation, training, international and industrial commercialization projects). Over the last 10 years, wagralim stakeholders have benefitted from 95 million € of public private money for projects in that area. Innovation platforms have been developed or are in development, with a budget of 1,6 mio €. These projects are supported by the regional government, beside private engagement. A technological platform “Keyfood” was launched last year in order to match short term technological needs in the industry with academic capacities. The platform included a new “open innovation driven” research building dedicated to food research at ULG Agro-Biotech, a human clinical platform at UCL and an investment in an animal facility at UNamur. The whole projects represents a budget of 10 million € in 5 years.

Wagralim is member of international networks active on this topic: European Food Alliance and is associated to the EIT KIC Food for future activities.

The European Regional Development Fund (ERDF) Operational Programme (OP) also has considerable budgets for research, development and innovation (440 million € for 2014-2020), with a focus on S3 priority areas. This program aims to boost economic growth in the region and to contribute to achieving the Europe 2020 targets for smart, sustainable and inclusive growth. Through investments that will support the knowledge economy, SMEs and the transition towards a low carbon economy. It should create jobs and boost productivity. EU funding will be targeted according to the unique strengths and development needs of the region. It finances equipment, research projects, demonstrators and grants loans for innovative SMEs.

The ‘classical’ regional budgets for research and innovation, allowing support to research activities and innovation (infrastructures, industrial research, experimental development, international cooperation, prototyping, …) amount to around 150 million € each year (7 million € for international cooperation through Eurostars, ERANETs,…). Those are not thematically focused, but contribution to S3 priorities is an important criteria.

As just described, the regional authorities can support different kinds of projects related to this theme, which is fully embedded in the S3 strategy.
* Which other regions/countries are interested in this proposed sub-area? Describe their interest and current level of commitment as well as complementarities and value added. Also, please add contact details.

Besides the Walloon partners, currently XX clusters from XX European regions/countries are committed to establish this European agri-food partnership on Nutritional Ingredients, with the support of their regional authorities (see all Letters of Support are attached).

Flanders’ FOOD is a cluster organization and approved as spearhead cluster for the agri-food industry in Flanders. In this perspective Flanders’ FOOD will be responsible to translate the Flemish RIS3 on agri-food into practice. Flanders’ FOOD believes in the future of the Flemish agri-food industry and together we ensure that also the next generations can enjoy tasty food for a healthy lifestyle. Collaboration on different levels is necessary for the future and especially in the framework of our role as spearhead cluster agri-food. We initiate and facilitate collaboration not only between research institutions, government and companies, but also across sectors and between all stages of the value chain.

One of the key topics of Flanders’ FOOD and its members is personalized food products & healthy diets. To provide an answer to the nutritional needs and demands of an increasingly aware and informed consumer. Certain growing consumer groups with specific nutritional needs (elderly, diabetics, people with food allergies, etc.) will be explored within this program line, as well as the possibilities of personalized foods and nutrition.

Flanders has some star companies that are not so visible for consumers, but world players in the food sector nonetheless. Specialty ingredient companies based in Flanders have a reputation for high quality and innovative products. But not only inherently Flemish companies have production units in Flanders also international companies have production sites and therefore generate economic activity in the Flanders’ region. These ingredient providers have in common that they develop and produce ingredients with high added value – not just bulk materials. As there is a trend towards more diversity in raw materials, new opportunities arise in functional ingredients, functional being both from a technical and a nutritional point of view. They are a fast growing sector that needs our attention as there are some exciting new developments in the production of functional ingredients coming our way.

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www.flandersfood.com

ILVO/Food Pilot

ILVO stands for multidisciplinary, independent research and specialized service provision in all fields related to agriculture, fisheries and food in Flanders. The food science research at ILVO covers the entire food production chain: from primary agricultural and fisheries raw materials to the processed product, ready for consumption. The research disciplines are microbiological and chemical food safety, product innovation, product quality and authenticity. The optimal use of all biomass locally produced is a key topic on the research agenda, with maximal use and recycling into the food chain as specific objective. The current consumer and market trends (clean label, balanced diets, sustainable and functional food ingredients…) are taken into account in all projects, guaranteed by closely interacting with all relevant actors, right from the start of the projects. For each of these research areas, ILVO has dedicated, state-of-the-art analytical labs. We also perform technological research focusing on innovative process and product developments via pilot tests for dairy and meat products, vegetables,
fruit and ready-to-eat food products in Food Pilot. This Food Pilot, initiated by Flanders’ FOOD and ILVO, is an application and analysis center where the food industry can optimize their products and processes. The production lines (semi-industrial scale) can be used to test new (functional) ingredients, recipes or processes. As mentioned, laboratory analyses and scientific advice are also available. The Food Pilot thus provides tailored support - either in a total concept from idea to product, or for one specific step in the processing trajectory. It is also an excellent venue for technology providers to demonstrate their newest technology or perform tests for their clients.

Contact: Bart Van Droogenbroeck (Senior Researcher, Technology & Food Science Unit)  
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Bio Base Europe Pilot Plant (BBEU)

BBEU (www.bbeu.org) is a flexible and diversified pilot plant for the development and scale up of new, bio-based and sustainable processes. It is capable of development of new bioprocesses, optimization of existing processes and scale up of a broad variety of bio-based processes up to an industrial level (from 5L to 50m³ scale, depending on the process). It can perform the entire value chain, from the green resources up to the final product. BBEU intends to close the gap in the innovation chain of the bio-based economy, bridging science and industrial production. BBEU was selected by the European Commission as a multi-KET Pilot Lines demonstrator (www.mkpl.eu). It is located in Ghent, Belgium. The activities of BBEU can be categorized in (i) Development of bio-based and sustainable processes (TRL 2-4); (ii) Scale up (TRL 5-6) and (iii) Pilot and demo production to allow market introduction (TRL 7-8). The BBEU team combines over 50 years of experience in fermentation development and scale-up, and also has extensive expertise in biocatalysis, green chemistry, valorisation of agroresidus and co products from food industry, extraction of valuable compounds from biomass and the development of industrial purification techniques. It is responsible for these tasks in several publicly funded projects (http://www.bbeu.org/pilotplant/projects) of which 19 EU projects and 3 regional projects are ongoing. In addition, BBEU is a service provider to many companies in the biotech domain and bio-based economy. In the period 2012-2016 it served > 100 European customers in > 200 projects for development, scale up or pilot production. BBEU has special programs towards innovation within SME’s providing vouchers to access expert services.
Letter of support received from:

✓ Danish Food Cluster, Central Denmark Region, Denmark

Letter of Support received: OK
Central Denmark Region
Viborg
Regional Development
Skottenborg 26
8800 Viborg, Denmark
Tel. +45 7841 0000

The undersigned, Kim Kofod Hansen, Managing Director, Dept. of Regional Development, hereby express interest from Central Denmark Region towards the participation of Danish Food Cluster as a partner in the project European agri-food and nutritional ingredients. Agri-Food is a subject of core interest for Central Denmark Region, the leading food region in Denmark. The region have a long history of developing innovation within agri-food business, working with Smart Specialization as a part of the strategy for Central Denmark Region. Danish Food Cluster is a vital part of the efforts of Central Denmark Region, and the region fully supports the cluster in their efforts of setting-up a new European platform.

✓ Asincar, Asturias Region, Spain

Letter of Support received: OK
Asincar
Poligono La Barreda, TL4, Parcela 1
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Web: www.asincar.com

ASINCAR is a Spanish agri-food cluster (awarded with Bronze label of the European Cluster Excellence Initiative) recognized by the national Industry Ministry and formed by 85 members (> 95% SMEs) coming from the whole value chain. Moreover, ASINCAR is also a Technology Centre recognized by the Spanish Ministry of Economy and Competitiveness. Under any of the roles, our main mission is to contribute to the competitiveness and sustainability of the agri-food companies and their adaptation to future market scenarios through innovation, cooperation, knowledge and technology transfer as well as support to access new markets. It is a meeting point for industrial actors, mainly SMEs, technology providers, research community, public administration and NGOs for fostering joint discussions, views and the development of solutions for the agri-food sector following co-creation and multi-actor approaches. Under the cluster role main activities refer to boosting the agri-food sector generating and catalysing opportunities for the enterprises, while technological capacities are focused on the development of specific research and innovation projects as well as technology transfer activities.
**CLUSAGA, Galician Region, Spain**

Letter of Support received: OK
Clúster Alimentario de Galicia – Galicia Food Cluster
Edificio FEUGA ofc. 17-18.
Rúa Lope Gómez de Marzoa s/n
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Web: galiciafoodanddrink.org

CLUSAGA is the cluster organization for the Galician agri-food sector, bringing together research and technological centres, business companies (both SMEs and incumbent ones). Our scope of action includes the whole food&drink value chain, with a strong focus on food&drink processing industries. CLUSAGA is a recognized key support instrument for the development and implementation of Galician RIS3, where the agri-food sector is specifically mentioned as of strategic socioeconomic importance, and collaboration for innovation in nutrition has been identified as the key for healthy diets and living. We also collaborate with the EIT KIC Food4Future.

Our work is based upon common goals and a joint strategic plan that brings together the complementary resources and capabilities of the main agents of the agri-food-drink value chain, in view of intermediating with local/national/international policy makers and of providing tailored innovation, intelligence (market and consumer trends, including healthy diets, personalized nutrition, sustainable and functional ingredients), incubation, analytical labs and pilot plants (namely on dairy, fish/maritime and meat) support services and national and international networking opportunities for Galician companies within the agri-food sector and other relevant value chains, namely ICT. In regards to specific consumer segments, we currently focus on elderly people and children/youth, where dietary and nutritional aspects are expected to have a bigger impact on healthy living.

**Cluster Food +i, La Rioja Region, Spain**

Letter of Support received: OK
Cluster Food +i
Pol. Tejerías. c/ Los Huertos 2
26500 Calahorra, La Rioja, Spain
Tel: + 34 941 152 718
Web : www.clusterfoodmasi.es

Cluster FOOD+i is a non-profit association that represents the Food-Industry of the Ebro Valley (SPAN). Cluster FOOD+i is an independent organization that joins companies, research & innovation centres and regional government institutions with the aim of promoting the competitiveness and the development of the Ebro Valley Region. The organization is recognized as “Innovative Business Group” by the Spanish Ministry for Industry, Tourism and Trade.

Currently Cluster Food+i interacts with an ecosystem that brings together approximately 300 companies, of those, 80% are SMEs. We firmly believe in the value of collaboration that is why we have developed a support system for our companies based on Open Innovation methodology. Through this system, we are able to help our companies to address their innovation related challenges thanks to the interaction with our technological partners.

The agri-food sector is key in the RIS 3 strategy of the Rioja region, so the government fully supports this initiative. Specifically, in recent years, the region has been working hard in close collaboration with...
Cluster FOOD + i in the development of new food products that increase the competitiveness of our companies.

✓ Aster, Emilia Romagna Region, Italy
Letter of Support received: OK
Aster
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Web: https://www.aster.it

Over the course of more than a decade, the Regional Authority partnered by universities and research establishments has created and developed the Regional High Technology Network, that currently totals 96 facilities, comprising 82 industrial research laboratories and 14 innovation centres. The industrial research laboratories are either public or private facilities mainly engaged in industrial research, as well as the disclosure and transfer of the results of such research for use by business. The High Technology Network is coordinated by ASTER and is organized on 6 thematic regional platforms, one of these is Agrifood. The Agri-food Platform represents a reference point for the innovation needs expressed by enterprises belonging to the food and agrifood sector. The Emilia-Romagna Region has drawn up its strategy by identifying areas to focus the action of regional innovation policies and, for each of them, the technological trajectories, innovative drivers and drivers of change to be pursued. S3 identifies four priorities, two vertical priorities that identify the reference production systems for research policies. (Priority A and B), and two horizontal priorities that concern the ability of production systems to meet the new challenges of society. In particular the scope of the S3 SUBPT “Nutritional Ingredients”, is strongly linked and perfectly coherent to one of the Priorities A, “Agrifood”, and its specific thematic objective dedicated to “Nutrition and Health”.

Aster comes with 3 regional stakeholders of their territory, which would like to be involved in the future activities of the Platform (see expressions of interest attached):
- University of Bologna
- University of Parma
- Agrifood ClustER

✓ Regional Development Fund Central Macedoine, Central Macedoine Region, Greece
Letter of Support received: OK
Region of Central Macedonia, Regional Development Fund, Department of European projects.
Themistokli Sofouli 62A,
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Tel. +302310403003
Web: http://www.rdfcm.gr

The Region of Central Macedonia, Greece confirms that the topics of “Agrifood” and “Nutritional Ingredients” are very important for its economy. RCM produces the 25% of the primary sector of the country. It has strong food processing industry with high quality characteristics and quantitative production capabilities. It has large agro-food units, with enviable history and perspective. It is the
Production Force for Greece, in the Agri-food sector. Agrifood is also one of the champion sector in Regional Smart Specialization Strategy (RIS3). RCM has a long list of traditional products having their origin on the rich local biodiversity. Local biodiversity in Greece and as an extend in C. Macedonia is among the richest worldwide and a priceless source for a high number of ingredients for the pharma, cosmetic and food industry. In the last decades, a high number of SMEs in Greece developed new products based on these ingredients and small thematic clusters have been created to support them. Currently in C. Macedonia there is a relevant number of SMEs working on the development of food products based on novel ingredients such as those extracted from algae, aromatic and pharmaceutical plants and even microbes used in fermentation processes. Furthermore, the need to isolate, characterize and valorize new ingredients enacted the connection between the local research laboratories and the SMEs giving rise on new spin-offs and spin-outs. C. Macedonia has nationally the highest concentration of Universities and Schools working on the agri-food sector. Worth mention the Aristotle University of Thessaloniki with the faculties of Chemical Engineering, Chemistry, Biology, Veterinary and Agronomy, the Technical Education Institute of Thessaloniki with the faculties of Food Technology and Nutrition, the Centre for Research and Technology Hellas with five Research Institutes, the American Farm School and the four Institutes of the Hellenic Agriculture Organization.

Terralia, PACA Region, France

Letter of Support received: OK
Pôle Terralia
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Terralia is the South-East France's innovation cluster for the vegetal, agricultural and food sector. It is a network of around 300 members composed of companies, research and training partners. We believe in the dynamics of networking and promoting innovation as a sustainable booster for growth. Terralia encourages collaboration between partners with complementary skills and stimulates synergies between developers and users of innovative solutions to make collaborative R&D projects. Furthermore, it provides support for economic development and growth of its member firms through a range of services: access to market/to finance, training of HR, CSR & intellectual property. Terralia especially focuses its actions on strategic thematic as “nutrition and health, quality of products” and “consumer and logistics and future eatings habits”. Then, it accelerates the launch of new products & services based on the results of research and collaborative projects boosting innovation to economic development in particular in vegetable food industry, eco-extraction, new ingredients and co-product valorization sectors. Among our members, they are key companies in the field on natural nutritional ingredients (as Naturex, Indena, Jean Niel) and on food transformation who can develop new products using these ingredients for personalized nutrition for example. We have also strong scientific competences and technical center in the field of nutrition, eco-extraction, food transformation (INRA-SQPOV & CNRH & C2VN, University of Avignon, CTCPA) relevant for this project. Furthermore, Terralia represents food producer sector and then can provide vegetal raw material (waste or specific crop), which are real opportunities for new ingredients development. Finally, Terralia is strongly involved in one of the “regional interested actions” of PACA region focused on Naturality. This project's objective is in accordance with the regional ambition to boost innovation in nutritional ingredients, local food and healthy products (clean label, Mediterranean diet promotion) to answer to the consumer needs and improve their nutritional and health status.
Marked Interests received from:

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* Please describe the extent to which this sub-theme is supported by businesses (clusters) and/or academia and/or civil society in your region.

- **Wagralim**: is the competitiveness cluster for Walloon agri-food businesses. Founded in 2006 as a not-for-profit organization by a group of entrepreneurs and academics, wagralim was accredited by Wallonia when it was launched as part of the Marshall Plan. Wagralim is an innovation network focused on the agri-food value chain. There are some 150 members in the network, among which important companies in the field of nutritional ingredients such as Cosucra or Kitozyme, as well as a large number of regional, Belgian and international partners. The cluster relies on both its leadership team and on specific taskforces made up of professionals and experts from the agri-food sector. Amongst competencies and strengths linked to the study and production of new ingredients (academic, research centers or technological platforms), one can cite strong know-how in the role of gut microbiota on health, new ingredients (insects, alternative vegetable protein sources, micro algae, etc.), management of breeding protocols of new species and efficient managing of the side streams of the food industry.

  Since it was founded, wagralim has helped to launch up to 42 collaborative research and training projects in Wallonia (accounting for a total budget of 95 million €). Our project portfolio is available on our website ([www.wagralim.be/projets-wagralim](http://www.wagralim.be/projets-wagralim)). At the international level, wagralim was a partner of BACCHUS, a European project whose main objective was to develop tools and resources that facilitate the generation of robust and exploitable scientific evidence, which can be used to support claims of a “cause and effect relationship” between consumption of bioactive molecules and beneficial physiological effects related to cardiovascular health in humans.

  Alongside these projects, the cluster has forged many links with foreign organizations and clusters, opening up a wide range of collaborative opportunities for its businesses and partners in the world of research. Wagralim has also facilitated the creation of technological platforms like Keyfood (run by the cluster) and Natextra, as well as the emergence of the D’Avenir program, bringing together all the financial stakeholders contributing to a more sustainable agri-food system. Every day, the cluster puts businesses in touch with stakeholders from their domain, both to respond to ad hoc needs and to develop ambitious innovation strategies.

- **Louvain4Nutrition**: is a multidisciplinary research platform targeting food and nutrition. A growing team of researchers from the “Université catholique de Louvain, (UCL)”, whose expertise covers many fields, address the crucial question: ‘What is a healthy diet?’ Louvain4Nutrition is part of the Louvain4 interdisciplinary research initiative, which aims to meet the great challenges of today and tomorrow.

  Louvain4Nutrition develops projects in: (i) food production; (ii) impact of food components at the physiological, biological and biochemical levels and (iii) legal, behavioral and social aspects of nutrition and health and will support the partnership via the large number of scientific and industrials connections.

  Some of Louvain4Nutrition’s projects:

  - **Food4Gut**: An interdisciplinary project that aims to show how consuming more sustainably grown vegetables rich in inulin (a dietary fiber fermented by intestinal bacteria) can contribute to a healthy diet and prevent obesity.
- **Treating obesity with stilbene:** This project, involving Vietnamese, Brazilian and Cameroonian partners, aims to evaluate the anti-adipogenic effects of piceatannol (a bioactive compound, called a stilbene, in the seeds of several exotic fruits) via intestinal absorption tests, in vivo and in vitro bio accessibility and bioavailability evaluations, toxicological assessments and advanced chemical characterisations, all involving different experimental models.

- **Clinical Investigation Centre for Nutrition (CICN):** Equipped with dedicated infrastructure for interdisciplinary research in nutrition and health, the centre specialises in the cognitive, emotional and behavioral aspects of nutrition, bioactive compound bio accessibility and bioavailability assessments, compound digestive biotransformation, and the study of the impact of food components on intestinal function.

- **CELABOR:** is a local scientific and technical services center based in Verviers (Belgium) which offers scientific and technical support to companies in the field of agri-food (nutrition and extraction), the environment, packaging, paper/cardboard and textiles. One of the aims of the nutrition department is to give support to industrials regarding the development of healthy products by the selection of adapted raw materials, formulation improvements in accordance with regulations (clean label or nutritional claims for example). Celabor also offers specific skills in packaging solutions and innovative food technologies to extend shelf life of food products in a healthy way. The center, with its high performing laboratory, has developed many skills in nutritional analysis (minerals, vitamins, fibers, fatty acids, polyphenols, sugars, proteins, etc.). CELABOR is equipped with a technological platform unique in Wallonia (supercritical CO₂, subcritical CO₂ and others) and is working on the development of extraction processes with a “green” orientation, the preparation of natural plant ingredients for food supplements, cosmetics and phytotherapy markets. CELABOR is a key facility in this partnership as they can provide technical solutions in their fields of expertise.

- **ULg-Gembloux Agro-Bio Tech:** has a large set of common facilities in food science and technology, which are gathered in the platform FOODisLIFE. The area covers food engineering and technology, from raw material to final product. The main objective is to mobilize the expertise in agricultural products valorization. More specifically, it concerns the fractionation of agri resources. FOODisLIFE includes pilot facilities (cracking, oil processing, preservation treatments including sterilisation and drying) and analysis laboratories (microbiology and physicochemistry).

  The University of Liège also has strong expertise in food science and formulation related to the physico-chemistry of powders, soft materials and complex food systems. The skills extend from surface properties (adsorption mechanism, monlayer compression isotherms, emulsifying properties, foaming, etc.) to hydrodynamic properties (viscosity, water absorption, gelling, etc.). A special know-how on the characterization of techno functional properties of food ingredients has been developed in the framework of improving the knowledge of foods, in particular their preparation, their preservation and their organoleptic properties. The study of food interactions as well as the search for synergies or antagonisms between the different compounds of these foods is also one of the important research area. Many current research is to understand how the physicochemical functionality of molecules at the nano- and micro-scales can be controlled to improve macroscopic properties of food (e.g., texture, shelf life) and its overall healthfulness. Fundamental and applied research projects are led on lipids, proteins, carbohydrates (prebiotics) and microorganisms (probiotics). This includes study on phase (or state) transition, crystallization, functionalization, colloidal state. FoodisLIFE thus has strong skills that will serve the partnership with adapted solutions for interregional partner technical-technological issues.
* Please provide some details related to the implementation of your proposal from its conception phase to the development phase of concrete investment projects, including milestones and expected outcomes at each phase.

The aim of this partnership is to promote interregional collaboration between industrials and a diversity of innovation partners to strengthen competitiveness of industries in their aim to better respond to specific consumer demands emerging from the market. This partnership thus offers the unique opportunity for interregional demand-driven innovation in the field of nutritional ingredients, following these 3 steps:

1) What are the trends over EU regarding consumer habits and consumer needs? What should industrials focus on to meet consumer demands? What triggers consumer behavior? What are the major market trends over EU or even broader?

2) All collected information leads to interregional discussion and validation of the topics of interest for the partners of the partnership. These discussions are recorded in the database of the platform, enabling the partners to use the “technology network” of the partnership which is a sort of interregional mapping of pilot plants and relevant research and technology facilities among partner regions.
3) A thorough “technology readiness level” (TRL) analysis will be led on each industrial need which will help to discriminate low TRLs (fundamental research) for which new developments are needed to give an answer to specific consumer demands from others which will just need upscaling tests for example. Indeed, existing technologies that are ready for the market needs (high TRL) need to be treated in a different approach (demonstration, communication, etc.) from the more recent ones at lower TRLs that still have to be validated. The latter ones need the demonstration of a proof of concept, a validation step and most probably technology developments at a larger scale to increase TRL up to an industrial scale. Low TRL levels, which are too “research focused”, will be directed to other solutions and funding possibilities whereas higher TRL levels will be taken in charge by the present partnership which is more industry/application focused.

4) Once the technology readiness level is clarified for each demand, new interregional collaborations between EU actors could be identified, offering solutions to potential gaps identified (e.g. technology supplier in one region that starts producing ingredient looked for in other region/by other actor), i.e. new B2B opportunities as necessary investments to meet the needs for the industrial development of the consumer-driven identification of new ingredients could also be identified.

Please include any additional comments.

* Do you agree that your proposal, your name, institution and email address are published at the S3 Platform website?
  
  - Yes
  - No

Thank you!
S3 Platform