



# Global SmartFood Project

## Ideas Laboratory Summary

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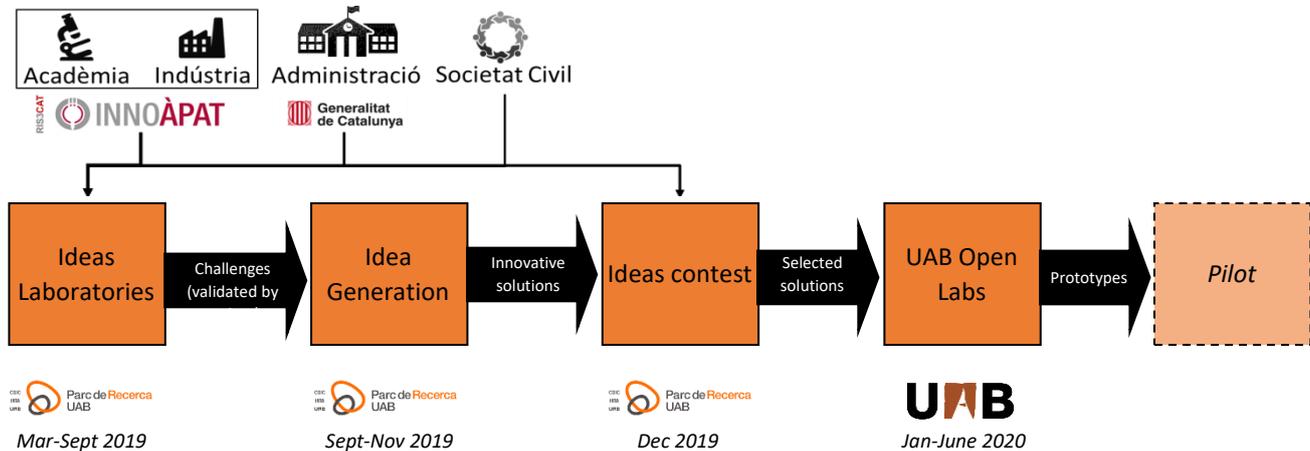


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## Ideas Laboratory Summary

The PRUAB is participating in the HIGHER project, financed by the Interreg Europe program. The idea behind this program is to help improve the innovation capacity of different European regions through public policies supporting smart specialization and the promotion of public-private R&D&I projects. Part of this program suggests an action plan for Catalonia consisting of a pilot test to introduce quadruple helix working methods into RIS3CAT communities. More specifically, this SmartFood pilot test is aimed at the INNOÀPAT community through four large stages as shown in the figure below.



These stages revolve around four challenges proposed by the INNOÀPAT community: **food wastage, plastics and food, the use of antibiotics in livestock, and personalised nutrition.**

The PRUAB and the UAB contribute their expertise and installations to carrying out these four stages through the following instruments:

- Laboratory of Ideas - “Societal Innovation Camp” (Stage 1)
- Program for Idea Generation and Ideas Contest (Stages 2 and 3)
- UAB Open Labs (Stage 4)

The **Laboratory of Ideas** is a program that promotes reflection on complex, conflictive and emerging areas of knowledge taking citizen perception of a specific subject as a starting point. It fosters the culture of innovation, the entrepreneurial spirit and helps to provide solutions in a specific area. The method used is *Design Thinking* which is defined as a creative process for the resolution of problems centred on people observing user needs to offer effective and viable solutions. In short, it is a learning process for the implementation of improvements.

This method has been progressively applied in three large phases:

### 1. First phase. Empathising with consumers

The objectives of this first phase are to better determine the social understanding of the challenges proposed within the *SmartFood* framework, perform a qualitative study of the social perception, display the objectives defined by citizens and establish areas of exploration or possible lines of approach to enable defining the situation using the method applied.

This phase was carried out by means of a 3-hour presential workshop with 24 participants of different ages, genders and social and cultural origins.

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The table below shows the distribution of the participants:

Distribution of participants in Workshop 1				
Gender		Age		Origin
Females	13	< 24	7	Civil society
		25-39	6	RDI System
Males	11	40-54	4	Business sector
		> 55	7	Administration

The *Design Thinking* method involves the use of a series of activities such as *Warm up* to prepare and integrate participants, *Visual Thinking* activities with metaphors to explore the imagination of each participant in comparison to the selected challenge, *SWOT analysis* activities to identify the strengths, weaknesses, opportunities and threats of each challenge and *Visual Thinking* activities with a treasure map defining the objectives and processes to achieve this end.

This workshop led to a better understanding of the social understanding of the challenges proposed, enabled performing a small qualitative study of social perception, display the objectives defined by participants and establish new areas of exploration or possible lines of approach to be used in the next phase, the Idea Generation program.

This workshop also indicated that the outlook of participants is rather negative, especially regarding the challenges of food wastage, the use of antibiotics in livestock, and plastics and food. The main concerns expressed by participants are the contamination of rivers and seas with plastics and human food safety; legislation regarding the use-by/best before date; the interests of the industry and legislators, and consumer comfort. On the other hand the personalised nutrition challenge is viewed as positive for health.

This session defined possible starting points for future projects that could fit into the Idea Generation program. These points are defined below according to the challenge:

- **Use of antibiotics in livestock:** chemical residues are considered as a future line of research as they pose many doubts; furthermore it is considered that the confinement and lack of mobility of cattle could be an important point to work on in new proposals to reduce antibiotic use.
- **Personalised nutrition:** research into personalised foods must include the nutritional, health and organoleptic aspects. One hopeful approach would be collaboration with chefs of renown.
- **Food wastage:** possible lines to be explored are considered to be the development of tests to detect pathogenic micro-organisms, treatment of organic waste and the creation a possible smart system to foster the reduction of organic waste.
- **Plastics and food:** the lines of investigation especially aimed at research into materials with hygienic and food safety properties such as plastics, but being fully recyclable.

It is important to note that education is a common and transversal consideration in all four challenges. All participants were convinced that it is necessary to educate from the beginning, that is, educate children from even the very youngest age.

These possible starting points led to various areas to be included in the second phase. The challenge a) use of antibiotics in livestock: mobility of the cattle and antibiotics and chemical residues; from b) personalised nutrition: pleasures-gastronomic- personalised; from c) food wastage: use by/best before dates for food and

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incentives for the reduction of organic waste and from d) plastics and food: materials that are biodegradable, hygienic and safe.

### 2. Second phase. Ideation and co-creation

The objectives of this phase are to generate connections and links between food industry and other professionals to encourage crossbreeding and unfold the maximum number of innovative challenges for later validation and presentation to teams in the Idea Generation program.

This phase was carried out in a 4-hour presencial workshop with 28 professionals from different sectors of the food and associated industries as well as professionals with creative profiles, including chefs, research workers, designers, managers, etc. The distribution of participants is shown in the following table.

Distribution of participants in Workshop 2					
Gender		Age		Origin	
Females	16	< 24	5	Civil society	5
		25-39	9	RDI System	15
Males	12	40-54	9	Business sector	7
		> 55	5	Administration	1

Continuing with the *Design Thinking* method, a series of activities such as *Warm up* and *Visual Thinking with Mind Maps* were used to encourage creative thought through the visualisation of ideas in an ordered and unified way, ideation or *Brain writing* activities to develop ideas in a specific working area and synthesis activities by means of a short-list of possible lines of approach where the participants consider all the ideas developed and select 10 lines of approach for each challenge for later validation in the third phase.

Based on the areas proposed in the first workshop and with leverage of the activities performed in this second workshop, various key ideas aided in identifying 58 lines of approach within the four challenges proposed. Nevertheless, it is necessary to bear in mind that these ideas must be reformulated or grouped together in the next phase as many of them are solutions that are far too specific. Furthermore, when developing these ideas it is interesting to cross lines, that is, combine two ideas from different challenges to create a single line of research.

These lines are then presented in a third workshop and more carefully synthesised to provide possible starting points for future projects that form part of the Idea Generation program.

### 3. Third phase. Validation of the lines of approach and research

The objective is to assess the ideas selected in the second phase as proto-projects to obtain feedback from experts to analyse their real potential as projects.

This phase was carried out by means of a 3-hour presencial workshop with 23 participants from different professional sectors of the food and allied industries. The main profiles of participants were research workers, non-profit organisations, managers, etc.

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The distribution of participants is shown in the following table:

Distribution of participants in Workshop 3				
Gender		Age		Origin
Females	12	< 24	1	Civil society
		25-39	5	RDI System
Males	11	40-54	6	Business sector
		> 55	11	Administration

As part of the *Design Thinking* method a series of activities such as *Warm up*, debate and reflection were used to identify positive and negative aspects as well as the doubts associated with the challenges, validation activities to summarise the more relevant lines in the opinion of participants and synthesis activities to select, according to the score given by participants, five possible lines of research for each suggested area.

The results of the validation activity revealed other lines of research, especially in regard to the plastics challenge and personalised nutrition.

As a result of this synthesis activity, all the lines of research suggested by the second workshop together with those arising from this one have been reduced to 5 lines of approach for each challenge.

The lines to be worked on in the Idea Generation Program are:

### **Use of antibiotics:**

- Research into animal welfare with special attention being given to the levels of stress, health problems, the relationship between cattle and the environment, among others.
- Creation of fast, economic diagnostic kits for veterinary medicine.
- Alternative treatments for animal health such as probiotics.
- Systems for the removal of residues, antibiotics and microbial resistance from wastewater.
- Training programs.

### **Personalised nutrition:**

- Study the organoleptic properties of foods and create a sensation map to encourage pleasure.
- Exploration of *reversal trends* including the scientific decoding of popular knowledge, the valorisation of native species, the promotion of in-season consumption or a better understanding of the history and culture of food.
- Reliable information versus fake news.
- Personalised diets.
- Detection of food risk components in pre-cooked dishes.

### Food wastage:

- Recipes to reduce food waste.
- Smart containers and systems for the efficient detection of the condition of food.
- Adjustments to legislation and labelling systems.
- Second life for foods not suitable for human consumption.
- Short marketing channels.

### Plastics and food:

- Design of new materials with less environmental impact.
- Management of bulk consumption.
- Transparency and tracking of waste plastic.
- Recycling of plastics.
- New legislation on re-use of plastics.

Once the lines of research have been selected in the Laboratory of Ideas validation phase, the project continues to the next stage which is the **Idea generation program**. This is an initiative that aims to contribute to encouraging the entrepreneurial spirit, culture of innovation and provide support for shaping the ideas of research workers and doctoral students of Catalonia focussed on the challenge defined by the community, but with a highly multidisciplinary profile with the idea of favouring *cross-fertilization*.

The program is free, lasts 50 hours over two months, two mornings a week and consists of practical sessions and training designed for research workers so that they can better understand their research studies at the university or basic technological ideas which are able to reach the market. The report on this program will be drafted in another document once this stage has been completed.

Finally, it is concluded that **UAB Open Labs** are the network of spaces for digital production in the Autonomous University of Barcelona. This new service is available to the whole UAB campus community, but at the same time it offers its services all over Catalonia with the idea of the campus becoming a space for experimentation, innovation and demonstration of new technologies and methods, for both the research community as well as its productive and social environment. In short, a driving force for social and digital innovation within the campus and the region.

The UAB offers two Labs to projects selected by the jury of the ideas contest, on the one hand, the Digital Lab, a space dedicated to 2D and 3D digitalisation where it is also possible to work with immersive virtual reality, augmented VR, 3D projection, *video mapping*... and a second space, the Production Lab dedicated to ideation and production of 2D and 3D objects based on digital production as well as performing activities related to sensorisation and *smart cities* or robotics.