7.9 The consumer behaviour laboratory (CONBELAB), Monells (Girona), Spain

The consumer behaviour laboratory (CONBELAB) of IRTA was created in 1988 with the aim of exploring, measuring, understanding, and even modifying human behaviour from a multidisciplinary perspective. Activities typically focus on combining both product-related measures and those focused on the individual and the environment in which they occur. The group's research activity has been centred on increasing the effectiveness of different information communication systems mainly aimed at promoting healthier and more sustainable lifestyles. It has also worked extensively on the development of new products and services through co-creation processes and the development and application of systems aimed at stimulating individual creativity. CONBELAB has a variety of technologies available to perform explicit and implicit behavioural measurements using direct (self-reported) and indirect (physiological sensors) techniques. By using own and external consumer databases, different studies all around Spain can be organised and performed, from those more visceral to those more rational, both in real and virtual scenarios. Regarding physiological measurements, the laboratory is based on the iMotions CORE and Tobii Pro Lab-Full Edition software, including modules for electroencephalography (EEG), screen based and portable eye trackers, hear rate, electrodermal activity and computer-based facial expression analysis. Design and implementation of virtual tours and scenarios is also possible for different contextual assessments at various immersive levels.

Important theoretical and methodological foundational elements in approach: To better understand consumer behaviour in relation to food, different scientific disciplines and methodologies are combined. Our research focuses on exploring the role and effect of different internal and external elements of the product on the decision-making process, the emotions they generate and how this is affected by contextual aspects. The measurement of individual cognitive load as a system to assess the impact and understanding of specific information presented in different settings is also a key topic in our activities. In addition, we are also interested in investigating the relationship between implicit and explicit measures.

Device requirements and guidelines:

The use of the infrastructures requires training and following the protocols established for the different types of measures, as well as applying for the corresponding ethical permissions associated with each of them. There are internal guidelines on how to use the equipment, the requirements for participants, how to conduct the experiments and how to analyse, store and

classify the data obtained. Harmonised guidelines developed within COMFOCUS for both emerging technologies and self-reported measures are also available.

All the devices are portable, allowing their use in laboratory conditions as well as in real or even simulated contexts through immersive rooms or virtual reality. The technical support necessary to develop the proposed activities can be provided both before starting the activity and on site by our technicians and researchers. All available infrastructures are described in this document.

Contact: Dr. Luis Guerrero, Senior Researcher, lluis.guerrero@irta.cat

	Virtual Reality device
Way the object of research is represented in design	Much effort and resources are spent each year on government campaigns aimed at influencing or modifying citizens' behaviour. However, they are not always as effective as expected. Virtual reality and its high degree of immersion can be an alternative to traditional media as it can turn an informational activity into a quasi-experiential one. Through the creation of different informative virtual tours (sustainability, use of alternative proteins, etc.) the effectiveness of different information campaigns will be verified by comparing them with traditional communication systems.
Overall research question	Is virtual reality a more effective system for promoting behavioural changes than the more traditional systems of communicating and providing information? **(Position 57)**
Key dependent outcomes	By means of an in-depth interview after presenting the stimulus (VR or traditional method), the impact that the stimulus has had on the participant will be assessed. Information (questionnaire) obtained before and after the experiment will also be available.
Complementary measures / self-reports	Both physiological (GSR or EDA and Heart Rate) and self-reported complementary data from the harmonised measures within COMFOCUS will be obtained.
	Immersive rooms device
Way the object of research is represented in design	Choice experiments attempt to approximate a buying situation more closely than a self-reported measure of purchase intention. However, they are often conducted under controlled conditions with low ecological validity. Conducting such experiments in a more immersive setting could increase the quality of these measures.
Overall research question	How does conducting choice experiments in immersive rooms influence the result obtained? **(Position 58)**
Key dependent outcomes	Importance and utility data will be obtained and compared under laboratory and immersive room conditions.
Complementary measures / self-reports	Both physiological (Eye tracking, GSR or EDA and Heart Rate) and self-reported complementary data from the harmonised measures within COMFOCUS will be obtained.
	Eye tracker device
Way the object of research is represented in design	The reading behaviour of the information provided on a food label can be related to the effectiveness and comprehension of the label. In addition, the incorporation of different elements (photographs, drawings, logos, colours, etc.) can act simultaneously as enhancers or distractors of the

	intended message. Different types and forms of information located on different food labels and their combination with these enhancing or distracting elements will be explored.
Overall research question	Can some supplementary elements of a food label and packaging influence the reading and understanding of the information contained in them? **(Position 59)**
Key dependent outcomes	Data will be obtained on the reading behaviour of food labels and their effect on the type of information retained and understood.
Complementary measures / self-reports	Both physiological (GSR or EDA and Heart Rate) and self-reported complementary data from the harmonised measures within COMFOCUS will be obtained.
	Heart rate device
Way the object of research is represented in design	The use of physiological sensors to assess the sensory perception of a food is complex since the manipulation of the product itself (e.g. chewing) can introduce artifacts that are difficult to measure and to eliminate. Most likely, the heart rate is one of the measures that is affected to a lesser extent by these unwanted effects and that could therefore be used to implicitly measure the sensory perception of a given product.
Overall research question	Can the self-reported acceptance of a product be predicted based on the heart rate measurement? **(Position 60)** Can the heart rate of an individual be related to the assessment of specific sensory attributes and the reliability of his/her response? **(Position 61)**
Key dependent outcomes	Both acceptance data of different products and their sensory description and heart rate will be obtained during their evaluation to establish possible relationships between the two measures (explicit and implicit).
Complementary measures / self-reports	Both physiological (GSR or EDA) and self-reported complementary data from the harmonised measures within COMFOCUS will be obtained.
	Galvanic skin response device
Way the object of research is represented in design	Cognitive load is an indicator of the relevance and effectiveness of the information provided and therefore of the capacity to induce behavioural changes in the individual. Several studies indicate the possibility of using skin electrical conductivity as a measure of cognitive load.
Overall research question	Can skin electrical conductivity be used as a reliable indicator of cognitive load? **(Position 62)**
Key dependent outcomes	The data obtained together with those provided by other implicit and explicit measures will make possible to evaluate the relationship between all of them during the execution of different exercises (reading, mathematical calculations, drawings, etc.).
Complementary measures / self-reports	Both physiological (EEG, Eye tracking) and self-reported complementary data from the harmonised measures within COMFOCUS will be obtained.
	Electroencephalography device
Way the object of research is represented in design	The measurement of brain activity has been used to measure both emotions and cognitive load. However, there are many doubts about its usefulness and application in food, where individual involvement is often relatively low.

Overall research question	To what extent are the emotions generated by a food product recognisable from an EEG? **(Position 63)** Can cognitive load during task performance (e.g. reading a nutrition label) be measured simply and reliably by EEG? **(Position 64)** Are everyday foods capable of generating EEG-measurable emotions? **(Position 65)**
Key dependent outcomes	The data obtained from the different sensors and questionnaires in the different experiments will be analysed and related to provide answers to the different proposed research questions.
Complementary measures / self-reports	Both physiological (GSR or EDA, Eye tracking) and self-reported complementary data from the harmonised measures within COMFOCUS will be obtained.
	Face reader device
Way the object of research is represented in design	Emotions play a very important role in our decisions, including those dealing with food products. However, their measurement is complex, and, in the case of food, there are serious doubts about their validity and predictive capacity for individual behaviours, given the low intensity with which they normally occur. They also must face the challenge of being measured during the consumption of the product, which may alter the facial expressions significantly.
Overall research question	To what extent are the emotions generated by a food product recognisable from a face-reading device? **(Position 66)** Can we obtain reliable measurements of the emotions generated by a food by means of the Face reader device when tasting a food product? **(Position 67)**
Key dependent outcomes	The data obtained from the different sensors and questionnaires in the different experiments will be analysed and related to provide answers to the different proposed research questions.
Complementary measures / self-reports	Both physiological (GSR or EDA, Eye tracking and EEG) and self-reported complementary data from the harmonised measures within COMFOCUS will be obtained.