

PhD: Food Science

Title: Design of satiating snacks targeting gustatory system to prevent obesity

Supervisor: Prof Paola Vitaglione

Co-Supervisor: Dr Ilario Mennella, PhD

Objectives of the research project and interdisciplinary collaborations:

Obesity is a worldwide societal burden and an independent risk factor of non-communicable chronic diseases such as type 2 diabetes, cardiovascular diseases and some types of cancer. Scientific evidence suggests that the consumption of snacks with poor nutritional value may be associated with high body mass index and eating in the absence of hunger, thus contributing to obesity epidemic. Providing a healthier food environment is a global urgent need.

This project aims to design and develop formulation solutions for healthy snack foods that support energy intake control in specific target populations.

The main drivers for snacking and preference for specific snack foods in different target populations will be identified and matched with physiological, psychological and dietary behavioral features that may underpin overeating.

Different food formulations will be designed to target gustatory system and trigger physiological responses that prolong satiety thus controlling energy intake.

The objective will be achieved with the collaboration of food technologists and marketing scientists at Ferrero.

Innovation and originality of the project in relation to the state of the art:

Evidence shows that the motivation to snack as well as the health impact of snacking are subject to considerable interindividual variation, that is still under investigated.

This project will explore the individual characteristics that influence the preference and choice of snacks in relation to the perceived taste and metabolic effect.

Several studies focused on satiating foods and found some promising ingredients to boost satiety when incorporated in specific food matrices. With this approach some proteins, fibers, or complex carbohydrates enriched snacks were demonstrated to be satiating.

The originality of this project consists in the multidimensional and systematic approach that will be used and evaluate the combination of different ingredients, their chemical transformation during the gastrointestinal digestion and the effect on individual gustatory system. This approach has the potential to individuate for each formulation will be tested, some marker molecules that can be formed during the digestion and influence satiety cues by binding the taste receptors in the gastrointestinal tract and triggering hormonal response or by interacting with gut microbiota.

Grant availability:

- Funding from Ferrero
- Project title: “ON Foods - Research and innovation network on food and nutrition Sustainability, Safety and Security – Working ON Foods” – SPOKE 4 - Project funded under the National Recovery and Resilience Plan (NRRP), Mission 4 Component 2 Investment 1.3 - Call for proposals No. 341 of 15 March 2022 of Italian Ministry of University and Research funded by the European Union – NextGenerationEU
- Project title: Food Innovation and Product Design (FIPDes 2019)

Collaborations with foreign institutions:

The PhD student will spend a period of 6 months at AgroParisTech, Université Paris Saclay, supervised by Prof Veronique Bosc and Prof Barbara Rega to evaluate the impact of formulations on the texture and volatile compounds formation in the products.

Collaborations with industries:

The PhD student will spend a period of 6 months at Ferrero (Soremartec Italia, Alba, Italy) that is co-funding the PhD fellowship (DM 630).