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INRAE AgroParisTech université PARIS-SACLAY

UMR0782

INRAE, AGROPARISTECH

Paris-Saclay Food and Bioproduct Engineering (SayFood)

Management

Catherine Bonazzi, director
Violaine Athès-Dutour, deputy director
Pascal Bonnarme, deputy director
Marie-Noëlle Maillard, deputy director

Keys figures

- 63 researchers & teacher-researchers
- 58 engineers & technicians
- 31 PhD students
- 20 trainees

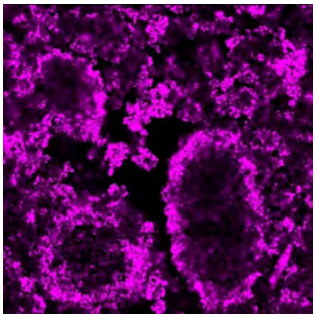
Experimental facilities

- Pilot plant for studying food processes and bioprocesses
- 5 "laboratory areas": physico-chemistry & microscopy, microbiology, chemistry-biochemistry, sensory analysis, instrumental manipulations
- Experimental restaurant
- PLASTIC platform (process data management - INRAE/TRANSFORM division)
- Analytic MetaVolFood platform, (part of the "Grand Défi" Ferments of the Future)

Mission and objectives

SayFood -Paris-Saclay Food and Bioproduct Engineering- is a research unit created in 2020 by INRAE and AgroParisTech through the merger of the GENIAL and GMPA joint research units.

SayFood 's mission is to acquire new scientific knowledge and propose new approaches in product and process engineering for the bioeconomy and the development of new sustainable food systems. The unit aims to contribute to product-process innovation that incorporates the constraints of upstream production as well as the needs and expectations of consumers and users. To conduct its research, SayFood relies on a range of disciplines, including process engineering, food and material chemistry and physico-chemistry, analytical chemistry, microbiology, industrial biotechnology, and consumer sciences.



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The unit focuses on the physical, biochemical and microbiological processes that govern the food and non-food transformation of bioproducts. It develops multidisciplinary and systemic mechanistic approaches to:

- contribute to product-process innovation that integrates upstream production constraints and consumer needs/expectations (urban and peri-urban food systems, personalized nutrition...);
- rethink (bio-) processing to develop the potential of new, healthy and sustainable food systems (fermented foods, new protein sources, valorization of co-products from agro-industries, limiting waste...);
- propose new approaches to product and process engineering, working in an interdisciplinary way on the design-consumption continuum and water and energy savings.

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- T Food Science & Engineering
- T Microorganisms, Health & Environment
- T Plant Science, Diversity, Health & Biotechnology
- T Digital Sciences & Systems Modelling

Topics

Research

SayFood is composed of 5 multidisciplinary research teams:

- Product engineering (**GéPro**): development of tools and knowledge enabling the rational design of food products and bio-based food packaging; reactional and structuring processes at various scales, up to the processing stage.
- Modeling and engineering by calculation (**ModIC**): development of mechanistic models to quantify strongly coupled phenomena and predict material behavior; use of models for design and engineering.
- Human-food interactions, from conception to consumption (**IHAC**): understanding interactions to contribute to the design of multi-criteria qualities of food; sensory perceptions and consumer behavior; breakdown of food in the mouth and digestive tract; understanding human-food interactions.
- Food Microbial Ecosystems (**CoMiAl**): understanding the structuring and functional expression of food microbial communities; fermented foods; ecological engineering; genomic analyses, microbial ecology and physiology, characterization of microorganism / surface or microorganism interactions.
- Microbial processes, stabilization, separation (**ProBioSSep**): design and optimization of processes by integrating product quality, process performance, and environmental impacts; membrane and chromatographic separation processes, stabilization processes (freezing, freeze-drying, drying), microbial processes (fermentation and bioconversion); processes intensification.

Collaboration

SayFood is involved in numerous national (ANR, France 2030, Ademe...) and European research projects and has strong research partnerships with the socio-economic sector. It is a member of the Qualiment Carnot institute and affiliated with the 3BCar Carnot. It is associated with the French National Metrology and Testing Laboratory (LNE) within a Joint Technological Unit (UMT SafeMat) and with the CoPack partnership chair, supported by the AgroParisTech Foundation. SayFood also supports the Food'InnLab of AgroParisTech (hosting start-ups, fostering student entrepreneurship).

Teaching

Teaching is one of the key missions of the unit's teams: 70% of the unit's researchers are teacher-researchers from AgroParisTech, Cnam, or the University of Paris-Saclay. They contribute to education across many programs:

- AgroParisTech & CNAM Engineering Programs;
- UPSaclay Master's programs (Nutrition and Food Sciences; Process and Bioprocess Engineering) & international master's programs [Erasmus Mundus FIPDes - Food Innovation and Product Design (FIPDes); Erasmus Mundus Bioceb - European Master in Biological and Chemical Engineering for a Sustainable Bioeconomy; European Master in Food Studies];
- Specialized Master's program in Product Innovation at the Interface of Culinary and Industrial Sectors (IPCI, co-led by AgroParisTech and Ferrandi School).

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