

Principle of conservation and processing

- **Principle of conservation and processing part 1 conventional** Total 10H CM, 5HTD, 6H TP (2HCM) Nicolas Bordenave, (2HCM) Irène de Guidi, (2HCM) Saul Assunção Bicca, (4HCM, 5HTD, 6HTP) Léa Vernès

The objective of this course is to have the knowledge of food processing mainly food sustainability. This course is divided in 3 parts. It will address three fundamental principles of food processing (unit operations, mass balance and energy balance). These theoretical principles will be put into practice through simple problems and linked to actual situations of large-scale food production. It will introduce the different strategies that can be used to stabilize foods, focusing on heat treatments such as pasteurization and sterilization. It addresses also the notion of equivalent treatment, process control, the various possible technologies and the impact on food quality. Finally, an introduction to fermentation as an ancestral and cultural low-cost food preservation process, run by microbial enzymatic activities, that brings a certain stability and quality value to raw material such as veggies.

- ✓ Understand food quality attributes and their changes depending on conventional food processing and storage technologies to improve the sensorial and nutritional characteristics of plant food.
- ✓ Master the basics of food processing and the associated technologies

- **Principle of conservation and processing part 2 innovation** Total 15HCM, 6HTP (9HCM, 6HTP) Sandrine Perino, (4H CM) Saul Assunção Bicca, (2HCM) Florence Charles

How to create innovation and intellectual property for applied research?

- ✓ Presentation of new technologies: Instant controlled pressure drop technology; pulsed electric field; high pressure processing; supercritical fluids: process and procedure; applications in food processing; HACCP and HAZOP; environmental impact; up-scaling or numbering; success stories in food industry. Microwave technology; ultrasound processing; solar energy: process and procedure; applications in food processing; HACCP and HAZOP; environmental impact; up-scaling or numbering; success stories in food industry.
- ✓ How to create innovation and intellectual property for applied research
- ✓ Current postharvest research and innovations and sustainable technology

- **Agro-food wastes potential** (7HCM, 9HTD) Sandrine Poncet, Agnès Rolland-Sabaté, Benoit de Sarrau, Carine Le Bourvellec

Large quantities of wastes are generated every year from the agricultural and food processing industries. Producing energy and/or added-value products from the recycling of these wastes is a major challenge from both environmental and economic perspectives. The “Agro-food wastes potential” teaching unit focuses on the following points:

- ✓ Understand the potential of food by-products for food and non-food applications
- ✓ Introduction to basic knowledge of bioeconomy, biorefinery and eco-design concepts. Illustration with winery by-products and distilleries
- ✓ Dry fractionation of agricultural by-products and wood resources as a processing step to produce energy, molecules and materials
- ✓ Sugar- and lipid-derived building blocks for the production of bioplastics. During interactive tutorial sessions, case-studies will be examined and a workshop will be prepared.