THE CHEFS GO TO SCHOOL: A COOKING&SCIENCE COURSE TO STUDY DEEPLY THE FOOD WORLD

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On June 29th, at the Campus de l'Alimentació de Torribera, started the first edition of the university course **"Cuina i Ciència"**. The aim of the course is to pull together, in the same field, cuisine and science. Usually the common opinion is that those are two different worlds but it is not like that. There are documents that talk about the relationship between cooking and science since the beginning of the XIX century. The physicist Nicholas Kurti was one of the most significant figures of the 60s who put a focus on the importance of studying foods from a scientific point of view. At the beginning the scientists were the ones interested on studying cuisine, but from the foundation of the elBulliRestaurant things changed: the chefs were the ones who needed the help of scientists in their kitchens.

This cooking course was created as a subsequent step of the "science and cooking" course at the Physic Department in **Harvard University**. While the course in Harvard is a course of science (physic) that uses cooking to exemplify scientific phenomena, the present course explains science in cooking.
The professional profile we will meet at the end of the course will be a "scientist chef". This chef is still an artist but can also use science to create an unforgettable culinary experience. The class consists of a heterogeneous group of cooking teachers and cooks that seemed really thrilled and dynamic since the first moment. They decided to follow this course to improve their skills in the kitchen ant to have a deeper knowledge about science.

The students of the course "Cuina i Ciència" with the chef Jordi Cruz

Chapter 1. Products and cooking technique

The first lessons were an introduction to the unprocessed foods (all the different types of animal and vegetable products). After that the course focused on a biggest section which is **cooking techniques**. The topic concerns the different ways to cook, but explaining first what *cooking* means. There are two different theories: in the first one, cooking means use of temperature to process foods; in the second one, it means any food process.

Very interesting was how **Professor Castells** tried to compare a recipe to a chemical reaction, where the ingredients are the atoms and the dish is the substance formed in the chemical reaction. As well as a chemical reaction with the same number and type of atoms produces always the same final substance, a recipe with the same quantity and type of ingredients and that uses the same procedures leads always to the same dish (well, we know that this don't always happens, but it's mainly like this).

The students dealing with the diferent cooking techniques

One of the most interesting activities of this course is the workshops. To introduce the different cooking techniques, the class was divided into groups which had to cook in teamwork with a different technique (boiling, microwaves cooking, caramelization, oxidation, acidity, etc). In this way they could exchange ideas and create together their dishes. A perfect example of "learn by doing".

On July 6th, still within the cooking techniques matter, the guest and teacher of the course was **Jordi Cruz**. The chef with 2 Michelin Stars at the ABaC Restaurant explained and showed how to prepare dishes using the boiling art. The development topic was **water and humidity**.

After a brief explanation of the scientific concepts of syneresis (separation of a liquid, usually water, once has formed a thick and gelatinous structure) and products synergy, the show could start.

Syneresis is usually an unwanted phenomena, but Chef Cruz reverse this concept and use syneresis for positive goals. Soups, broths, cocktails, and many other goods (with meat or fish) were prepared and all cooked with the same technique. However, one of the dishes that created most curiosity and surprise among the students was the *scamorza spherification*, obtained by making an infusion of Parmigiano Reggiano and smoked cheese and using afterwards mascarpone, gluconolactate and xanthan to create the sphere.

Scamorza spherification by Jordi Cruz

The following day was the turn of another special teacher, the main expert of *sous vide* **Salvador Brugués** member of the team of the restaurant El Celler de Can Roca. The development topic of the lesson was **cooking at low temperature** [1, 2]. The chef was inspiring! But what does cooking

at low temperature mean? Trying to cook foods at a temperature similar to what we have at the heart of the product: meat 50º / 55º-65º; vegetables 85º; fishes 40º. This technique gives the opportunity to avoid water release: the tendency is always to retain water within the product so that the aromas and flavors won't be wasted.

Chef Salvador Brugués with his team

There are hospitals, in Germany for example, that have already started cooking at low temperatures and there are increasingly more tools to control the temperature (without using the vacuum). Even devices that you can easily use at home, like the "slow cooker".

The first part was a theoretical lesson with explanations of the different ways to cook at low temperatures. Everything was even more interesting and fun when the lesson became more interactive and dynamic. The students could taste and see the modifications between the same foods cooked at different temperatures, also through games. Everybody seemed to really enjoy it and the curiosity of the students produced interesting exchanges of opinions with chef Brugués.

This first big chapter ended studying the **fried foods** and the **oil uses** thanks to the explanations of **Carles Tejedor**, leader of the project Oilab [3, 4] and manager of the restaurant El Nacional in Barcelona.

Chef Carles Tejedor during the lesson

Oils are basic in the cooking world, so it's very important to study them from a scientific point of view. Carles Tejedor showed how the best way to save the oil is to freeze it. From this point on, with the temperature increase (0º - 190º) the oils change. The chef, who also gave a lecture at Harvard University, prepared some wonderful *Patates souflée* using potatoes from the previous year and frying them in two steps: at 120º and at 190º.

The course continues with the second chapter, which main topic is "the textures".

[1] Joan Roca and Salvador Brugués. 2003. *La cocina al vacío*. Montagud
[2] Thomas A. Vilgis, Hubertus Tzschirner. 2014. *Sous Vide. Iniciación A La Técnica De Cocción Más Delicad.* Fackelträger.
[3] http://www.oilab.info/
[4] http://www.oilmotion.com/

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