

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

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Chapter 2. The textures

The course continues with the second chapter, whose main topic is “the textures”.

As at the beginning of each new chapter, Prof. **Pere Castells** gives at the class a general introduction to the topic. The food texture is a set of physical properties (density, viscosity, surface tension, hardness, etc.) of a food product, which gives it defined characteristics perceptible by the senses, especially by the touch [1]. There are three texture properties: MECHANICAL (food reaction before an external force), GEOMETRIC (size, shape and distribution of the particles in the product) and SURFACE (the sensations produced by the fat or water content of the product, and how the constituents are released in the oral cavity). Subsequently Pere Castells showed the differences between the texturizers: thickening agents, gelling agents and emulsifying agents.

As described in the previous article, in this course it is very important to involve the students in sessions where they can learn scientific concepts through practical activities. Divided into pairs, the students prepared several meals using different texturizing agents (Agar agar, Gellan gum, Iota, Kappa, Xanthan gum, Glucan, Soy lecithin etc). It is stimulating to discover how those food additives work. Most of the students already use them in their kitchens but without knowing their scientific processes. The theoretical part of the second chapter continued with the support of Prof. **Albert Monferrer**, who focused on the various texturizing agents and explained their role in foods from a chemical and physics point of view [2].

After this introduction, for several days the group was involved in practical lessons with experienced chefs who focused, each one, in a different area of textures.

Chef **Oriol Castro**, from the restaurant *Compartir i Disfrutar*, was the first one to open this series of lectures. He gave a detailed description of the **gelling preparations** and the main food ingredients used to obtain this texture. Gelatin, Agar agar, Kappa, Iota, Alginate, Xantana and Methylcellulose were the texturizing agents that Chef Castro used [3]. Probably the most surprising preparation of the lesson, at least for an Italian like me, was the *macarrones a la carbonara*. The macarrones were prepared using a gelatinized ham bone broth...Incredible!



Macarrones a la carbonara by Oriol Castro

On July 10th the guests of the course were Chef **Sergi de Meia**, owner of the homonym restaurant, and **Francesc Armengol**, Chef of the restaurant *Ca n'Armengol*.



Chef de Meiá explaining flours differences

The development topic of the morning session was **flours and starches**. Chef de Meiá summarized the main differences between those two products: flours can be made mainly from cereals, but not limited to them (wheat, corn, potatoes, beans, chickpeas, rye, oats, and rice), while starch is an element of the flour (a polysaccharide consisting of a large number of glucose units joined by glycosidic bonds). Very

interesting was the debate between the students and the teachers on which preparations can be defined as sauces, which as creams and which as purée (or mash). The common conclusion was that they could be defined according to the use we make of them [4].

Afterwards, Chef Armengol talked about the **textures derived from processes**. In the cooking world it is common to use different techniques (acidification, osmosis, maceration in alcohol, marinating in fruits, freezing and pressure) to modify the natural texture of foods to make them easier to digest. Moreover, the same techniques are used to increase the shelf life of the products since ancient ages. Nowadays the aim is to use those techniques to reach a higher organoleptic level.

On July 13th it was the turn of **Victor Quintillá**, who focused on the **emulsions**, and of **Paco Pérez**, who developed the topic concerning the **viscous and airy textures** using Xantana, Kudzu, Isomalt, Soy lecithin and Sucrose ester. Chef Pérez, five Michelin Stars obtained with three of his restaurants, prepared different dishes,



Strawberry gazpacho by Paco Pérez

but two of them literally shocked the students: the black egg and the strawberry gazpacho (a real deep and studied application of many different cooking techniques).

The biggest chapter of the Cooking & Science course ended with a two-day full immersion in the pastry world. **Pere Castells**, and the pastry chefs **Enric Rovira** and **Josep M. Ribé** tried to give a



Macarons by Josep M. Ribé

scientific-technique explanation to pastry. They explained that when pastry preparations are well parameterized, we do not need to loose time making preparation tests. Indeed they summarized it in 30 recipes. Based on a previous work with the Alicia Foundation, they could realize a new classification of basic traditional pastry recipes according to textures (liquid, gas and solid). Later, Josep M. Ribé showed how to prepare some of the three texture types of desserts: pastry cream and smooth truffle (liquid texture), chocolate cake and macaron (texture derived by gas), strawberry fruit pulp and hazelnuts sablé cookie (solid texture).

The course continues with the 3rd chapter: “cooking technologies”.

- [1] Fundació Alícia. 2006. *Lèxic científic i gastronòmic*. Planeta.
- [2] Fundació Alícia. 2015. *Achef's Guide to Gelling, Thickening, and Emulsifying Agents*. CRC Press.
- [3] MANS. 2010. *Sferificaciones y macarrones*. Ariel.
- [4] Harold McGee. 2007. *La cocina y los alimentos. Enciclopedia de la ciencia y la cultura de la comida*. Debate.

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