



Culinary Concept

New concept of desserts with no added sugar

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Abstract

Desserts are known in many cultures of the world as courses that typically come at the end of a meal. They usually consist of sweet and creamy food and, consequently, high in sugar and fat. The aim of this work was to take advantage of the natural sweetness of fruit and to enhance it with different techniques in order to break with the idea that finishing a pleasant meal involves sugary foods. The techniques used to enhance product sensory attributes were vacuum cooking, hot infusion, filtration, vacuum impregnation, smoking, gelling, aerating and freezing. As a result, a novel culinary concept for creating desserts without the addition of fat and sugar has been developed. Pear, grapefruit and figs are some examples of products from the vegetable kingdom that with the right combination of aromas and textures could be the key ingredients for the elaboration of natural and healthy desserts.

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Introduction to the culinary concept

Although the predilection for sweetness is evolutionary in origin, dessert is a purely cultural phenomenon. Throughout history cultures have found in fruits many uses for dessert: dried dates, figs, and other fruits were commonly used for this purpose in the Ancient Middle East; grape juice used to be boiled down to a thick, sweet syrup for sweetening pastries. In Egypt, apiculture goes back to at least forty-five hundred years and these days the most widespread ancient sweetener is honey. Sweets were fed to the gods in Ancient Mesopotamia and continue to be the preferred sacred offering among Hindus (Kronl, 2011).

In the past, dessert was only available to the wealthy people; the creation of sweetmeats was always reserved for special occasions where cost was not an issue. Imperial Rome had professional sweet makers at their pastry shops. In Renaissance Venice, confectioners were also expected to be skilled sculptors,

sometimes collaborating with noted artists. This caused sugar to be one of the first food ingredients to promote international commerce, after all, the heart of dessert is sugar. In Europe, sugar was a rare and expensive spice before the slave plantations of the New World made available its confectionary.

Sugar was especially appealing because it was quickly metabolized and absorbed yet it provided “empty” calories lacking in minerals and vitamins. Sugar’s crucial role in industrialization developed gradually as the plantation system expanded to make sugar more available and as sugar proved to be an ideal complement to the tropical foods such as tea, coffee and chocolate, which began to reach England in the seventeenth century. These are all bitter, calorie-free, stimulating drinks that are sweetened by the addition of sugar (Bodley, 2011).

Sugar consumption by the English working poor grew in stages. It was used first with tea and then in rich puddings, which by the nineteenth century became a dessert course to an end meal (Mintz, 1986). Sugar was combined with wheat and flour in sweetened baked goods; by the end of the 19th century sugar became a relatively cheap source of calories and tended to supplement and replace more expensive grains, fruits, vegetables, meat and dairy products.

As Kronl (2011) explains the French noun “dessert” originates with the verb *desservir* or *un-serve*, which means to remove

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what has been served. In other words, “le dessert” was set out once the table had been cleared of the dishes that made up the main part of the meal.

By the 18th century the gradual replacement of *service à la française*, where numerous dishes were served simultaneously, by *service à la russe*, where one dish followed another, resulted in dessert as we know it.

Instinctively, humans show preference for sweet flavors because they are considered as a source of energy, avoiding those that are bitter and sour as they are related to toxicity and danger (Plotnik and Kouyoumdjian, 2011). From a simple point of view, physiologically the body is no more than a chemical processing unit that runs on water, oxygen and sugar. The food we eat is eventually reduced into glucose, a simple sugar. This chemical reaction takes less effort if we supply sugar itself to the body, whether in the form of lactose, fructose or sucrose, for instance.

Changing dietary habits and sedentary lifestyles have led to an increase in worldwide obesity with the World Health Organisation reporting 12% of the adult population being obese (WHO, 2012). Current estimates from the Food and Agriculture Organisation's (FAO, 2012) expect the daily intake of calories to rise from 2803 kcal/capita/day in the late 1990s to 3050 by 2030. Government, health professionals and retailers are continuously putting pressure on food manufacturers to reduce the calorific value of sugar rich, processed food products (Navarro et al., 2012). There are different strategies to transform traditional recipes into low fat or low sugar versions for the food industry: (a) by reducing its content and/or (b) by using ingredients that mimic their functional properties. Nevertheless, it is still a challenge for food technologists to preserve the original sensory attributes of a traditional dessert while still achieving reduced calorie contents.

On the opposite, *avant-garde* cuisine is searching for pleasure by exploiting the characteristics of products at their purest state on nature (i.e. natural), creating healthier desserts with alternative strategies than those applied by the food industry (Adrià, 2004).

Generally, a piece of fruit is enjoyed without the addition of sugar; likewise, many products have the ideal characteristics for elaborating sweet recipes with no added sugar. However, in order to obtain the feeling of sweetness exclusively from the product, its structure and functionality must be understood beforehand. Controlling variables such as the ripening period may allow the creation of naturally sweet desserts as sweetness of fruits and vegetables depends mainly on type and composition of sugars present. In most of the fruits, glucose and fructose form the major proportion of soluble sugars, while in few wild species of tomato and melons, sucrose is the major sugar. The amount of total soluble sugars changes with fruit maturity showing a maximum score at ripening. Therefore, sweetness can be obtained without the addition of extra ingredients that do not naturally occur on the raw material used for the elaboration of the dessert.

Our research and development process focuses its creativity on reducing the importance of added sugar and fat in desserts by creating a new concept of natural and healthy dessert where

the main character is the fruit or vegetable. The challenge accepted in this work was to obtain the essence of fruits by linking creativity, taste memory, surprise and emotions. Therefore, the aim was to investigate how to enhance the natural sensory attributes of different fruits by adapting existing culinary techniques: vacuum cooking, hot infusion, filtration, vacuum impregnation, smoking, gelling, aerating and freezing.

### Culinary concept: definition

The new culinary concept consists of using naturally sweet fruit on desserts, enhancing its attributes with different techniques in order to break with the idea that finishing a pleasant meal at any casual or fine dining consumer based contemporary restaurant involves eating fatty and sugary foods. The techniques used to enhance product sensory attributes were vacuum cooking, hot infusion, filtration, vacuum impregnation, smoking, gelling, aerating and freezing.

### Description of the culinary process

The concept development process starts with the selection of the “*star*” product depending on seasonality. Farmers can be asked to provide the raw material at different growth stages so the same product is studied all along its shelf-life; occasionally new properties that do not occur in the product as we use to eat it are found. Furthermore, producers can be asked to harvest their crops in a particular way or also to provide by-products as sometimes they can have unknown culinary applications.

With all this information, a brainstorming process takes place and different ideas are brought up to the table, including potential cooking techniques that may be applied for studying their effect on product properties (i.e. direct fire, vacuum oven, water bath, vacuum cooking, raw cooking, etc.) resulting in a dish idea. At this point, quality standards of the prototype dish are defined and everything is organized with the producers/breeders in order to ensure product meets the quality standards.

Throughout the development process there is not a methodology clearly established because products are so variable that essence might be lost if always the same methodology is applied, therefore, the key relies on adapting to the product instead of adapting the product to the restaurant's needs. This philosophy accepts the risk of high variability among dishes due to seasonality and weather conditions that might affect product freshness and availability, but as a result, customers are offered very natural and healthy food options at their best.

### Case studies

As mentioned above, the starting point of this new culinary concept is the idea of taking advantage of fruits for developing new and stimulating desserts without adding any sugar. The case studies presented below have all the same starting point but different motives and histories.

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