

Improvement of a culinary recipe by applying sensory analysis: Design of the New Tarte Tatin

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Abstract

During the last decade, knowledge of food science and technology has been applied to *Haute Cuisine* obtaining great benefits. The most important chefs of the world are keen on gaining knowledge about the physicochemical changes to food after any culinary process, as well as the art of combining different flavors in order to obtain both new flavors and new textures. This could allow chefs to develop new processes and hence gain a competitive advantage in their restaurants. Sensory analysis can be a good tool to develop new products in a restaurant, in particular, new desserts. Consumer response to the sensory properties of food (particularly appearance, flavor, aroma, taste and texture) is an important factor in determining the success of new products. Therefore, the aim of this work was to develop a new dessert, based on the classic French dessert “*Tarte Tatin*” (an upside down fruit tart, usually made with apples), using sensory analysis as a crucial tool in its design. The preference for different apple products prepared using different methods of cooking, was evaluated by a consumer panel and the statistical analysis showed significant differences ($\alpha = 0.05$) between the processes.

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Introduction

In the last few years, gastronomy has become an important feature of the socio-economic landscape of many countries. Its development is so important that there are more and more chefs who dedicate part of their professional activity to the investigation of new methods for preparing new foods with better sensory characteristics and at a fair price. Nevertheless, in the kitchen much is still based on empirical knowledge and there is little scientific knowledge of the culinary processes that underlie the

quality of a gastronomic offering. To preserve quality over time, gastronomy should be standardized and based on the formal knowledge of chemistry and physics.

The most innovative trends developed by international chefs are based on methodologies and processes commonly used in investigative laboratories of Food Technology: the texture changes, flavors and aromas, time-controlled cooking, vacuum technology, supercritical extraction and other methods that have been applied for many years in research laboratories and in the food industry. The processes frequently used in the scientific arena and in the food industry are considered innovative by chefs. At present, culinary activity is a balance between tradition and technology, and the food technology knowledge that

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reaches the kitchen does so sporadically. Since 1988, Hervé This and Nicolas Kurti (Cassi and Bocchia, 2005) have been studying the physical and chemical processes that occur during the cooking of food. Thus, most gastronomy knowledge nowadays has been extrapolated from industrial processes, but always considering the unique connotations and peculiarities of a culinary preparation.

Over the past decades, chefs have introduced into their kitchens some tools and ingredients used by science and the food industry. Apart from the term used to describe this culinary movement, this “modernist cuisine” is characterized by the adoption of the scientific method to obtain new combinations of food and sophisticated culinary processes.

This new field is a combination of scientific knowledge about the physicochemical and technological properties of food and the experience of chef regarding culinary processes and recipes. This binomial ‘scientific-kitchen’ has resulted in new products and new combinations, new methods, techniques and tools that are used in the production process of foods (Barham et al., 2010).

The most important chefs of the world have a desire for the existing knowledge about the physicochemical changes that food undergoes after a culinary process and the art of combining different flavors in order to obtain new flavors and new textures, in this way they could develop new processes and gain a competitive advantage in their restaurants. Sensory analysis can be an important tool to develop and improve these new preparations. The responses of consumers to the sensory properties of food, particularly its appearance, flavor, aroma, taste and texture, are important factors in determining the acceptance of new products. In this way, the aim of this work was to develop a new preparation based on “Tarte Tatin”, using sensory analysis as a design tool.

Materials and methods

Raw materials and sample preparation

For the present study, apples of the Granny Smith variety were used. They were acquired at a local market and were selected with the same dimensions and from the same batch. Granny Smith apples have a luminous green color, although some of them can have a pink skin. They are crunchy, juicy and acidic and so they are excellent to cook with and to eat raw. They are also fabulous in salads because the slices do not oxidize as rapidly as other types of apples. They have a stronger texture than other green apples which allows for infusions with better results. They are especially famous as one of the most commonly used apples for the production of apple pie and in general in other bakery products.

Here, the apples were peeled and cut in quarters and the seeds were removed. Then one of three processes was applied: for Sous-Vide (under vacuum), apples were vacuum packaged; for Cook-Vide (cooked in a vacuum), apples were placed without previous packaging directly inside a Gastrovac[®] basket (Fig. 1) and for Moist Heat, apples () were placed inside an oven programmed to 100% humidity (at atmospheric pressure).

In the first test, the apples were cooked in Sous-Vide to a temperature of 75 °C for three different lengths of time: 90, 120 and 150 min. In the second test, three different cooking treatments (Sous-Vide, Cook-Vide and Moist Heat) at 75 °C for 120 min were evaluated. Once the cooking treatments were finished, the apples were packed in vacuum bags and cooled rapidly. Finally, sensory evaluation of the prepared samples was performed.

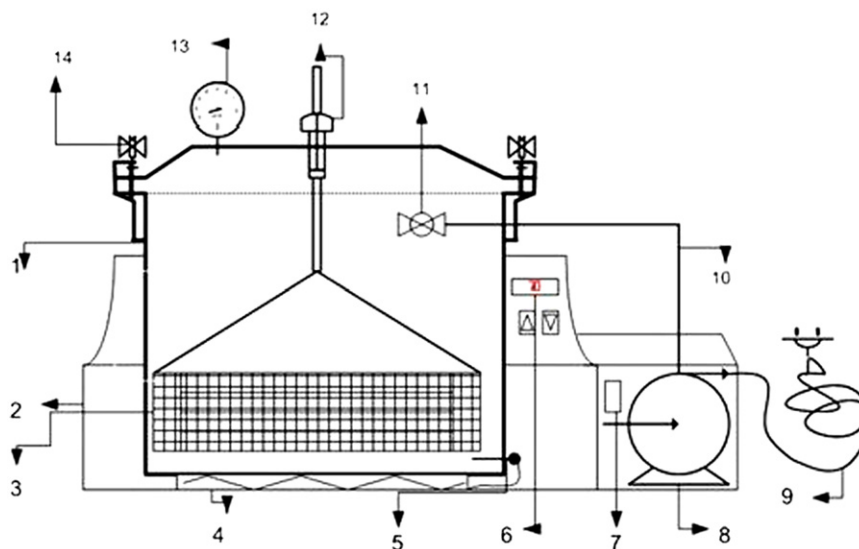


Fig. 1. Equipment for vacuum cooking (Gastrovac).

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