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“La Vie en Rose”: a note by note savory dish

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Abstract

A note by note recipe for a savory dish named “La vie en rose” was devised taking into consideration the idea of reducing waste and losses. This dish is made up of four main elements: crunchy bacon-flavoured gelatin shell; a mild and creamy caseinate sauce; an airy cake with a toast flavour; a tomato emulsion-gel. Overall, the dish is rich in shapes (geometric and abstract), textures (crunchy, soft, doughy, liquid...) and flavourings (bacon, bread, smoked, tomato, floral...). The texture and flavour of the shell look like that of a piece of bacon which, combined with the airy, fluffy, bread-flavoured cakes, was reminiscent of a good old-fashioned butter and bacon toast. The revisited shape gives the dish a modern, gourmet look. The smells of bacon and toasted bread are captivating and announcing what is going to be eaten.

Keywords

Note to note cooking, innovation, food waste.

Introduction

Note by note cooking is a new form of culinary based on synthetic cooking, a technique that was

proposed by This (2013). It involves designing dishes from compounds (either pure compounds or simple mixtures of them) instead of conventional food ingredients (Burke *et al.*, 2016). This approach has multiple benefits in terms of creativity, personalization, scientific exploration, innovation and allergen management, but can also have a role in waste reduction and sustainability.

According to the Food and Agriculture Organization of the United Nations (FAO, 2019), food waste is defined as the reduction in the quantity and/or quality of food caused by choices and actions taken as much by consumers as by retailers and food service providers.

In this context, the relevance of note by note cooking is not limited to its revolutionary nature. Indeed, by using pure compounds or mixtures of compounds that are obtained by fractionating plant or animal tissues, wastage of perishable ingredients could be avoided.

Note by note cooking is also part of a crucial societal context, where the issue of waste is becoming increasingly worrying, opening the way for in-depth reflection on the methods of food production, distribution and consumption

that are essential to preserving our natural resources and combating global food insecurity.

In 2023, a proposal was made by the authors for a dish embodying the innovative principles of this approach, entitled "La vie en rose", taking into consideration the importance of reducing wastes and losses. To address this issue, this project revolved around creating a meal using components that can be extracted from food that would otherwise go to waste. Moreover, in order to align with the chosen topic of the International Contest of Note by Note Cooking, this dish focuses on using components from the most commonly wasted foods, such as bread and vegetables (Masson *et al.*, 2019).

In addition, the dish was formulated with the understanding of how food texture works. Indeed, the recipe was conceived with the comprehension of the molecular interactions which happen between the different compounds used and the understanding of the impact of the techniques used on the final result.

The design of the dish

The name "La vie en rose" is inspired by the French idiom expression "voir la vie en rose", which can be translated as seeing life in happy hues or through rose-coloured glasses. While the idea of finding a miracle solution to world's food wastage may be idealistic, we worked towards that ideal. Our aim was to create a "green" dish, in the sense of being environmentally friendly, from ingredients that could be extracted from food waste.

Furthermore, embodying the expression that inspired our dish, this was created so that pink was its main colour: "La vie en rose" is presented in a variety of pink shades. This colour is often associated with sweetness; however, this dish aimed to deceive the consumer's instinctive expectations triggered by the colour, being a savory dish. To be more specific, eating "La vie en rose" should be reminiscent of eating toasted bread with tomato and bacon in terms of flavour, while also conveying the visual sensation of eating a dessert.

The dish was made of four parts :

- gelatin shell,
- caseinate sauce,
- toast flavoured cake,
- tomato emulsion-gel.

Components

1. Gelatin shell:

Ingredients

Water: 30 g

Red carmin colouring powder: a dash (Louis François, ref 10040,1245A)

Gelatin: 10 g (Louis François, ref 10132)

Bacon flavouring: 0.5 g (Meilleur du chef, ref Baco 58).

Process:

The gelatin shell is used to contain all the elements of the dish. It is prepared with a flavoured and dehydrated gelatin:

1. Mix gelatin powder and water with a whisk.
2. Add food colouring and food flavourings.
3. Heat the mixture in the microwave twice for 30 s at 800 W.
4. Whisk the mixture until it turns smooth and pour a tablespoon of mixture in each half-sphere shaped mould with a movement of rotation until the gelatin solution solidifies on the surface of the mould.
5. Leave to dry for one day before demolding.

2. Caseinate sauce:

The primary purpose of this caseinate based sauce is to provide a creamy and milder flavour to the dish, as well as to enhance its visual appeal.

Ingredients:

Water (for the caseinate solution) : 100 g.

Caseinate powder (for the solution) : 10 g (Sapoprepur).

Water (for the hibiscus infusion): 125 g

Dry hibiscus flower: 5 g (Nature et Découvertes)

Process:

1. Part 1: Mix caseinate powder and water with a silverson mixer.
2. Part 2: Hibiscus infusion. Boil water and add dry hibiscus flowers. Then Infuse the flowers for 15 minutes.
3. Mix the two parts together with a whisk and strain.
4. Optional : add pinches of citric acid on top of the sauce to create a colour gradient.

3. Toast flavoured cake (Table 3) :

The cake recipe was formulated with the idea of getting a texture equivalent to that of chiffon cakes (Godefroidt *et al.*, 2019).

In order to obtain the desired texture, sunflower oil was mixed with water using lecithin as an emulsifier, while a foam made of water and egg white proteins was added to the batter.

Ingredients:

Water: 85 g + 45 g.
Egg white proteins powder: 15 g (Louis François, ref 251 B)
Table sugar: 1.5 g (Eco Plus)
Citric acid: 1 g (Louis François, ref 10107)
Sunflower oil: 65 g (Eco Plus)
Agar-agar powder: 1 g (Kalys, ref HP696-25)
Lecithin powder: 5.2 g (Louis François ref 10040, 1245 A)
Smoky food flavouring: 0.7 g (Meilleur du chef, ref fume 58)
Salt: 1.5 g
Grilled bread food flavouring: 0.5 g (Meilleur du chef, ref paing58)
Red carmin colouring powder: a dash (Meilleur du chef, ref crc20p15).

Process:

1. Part 1: Meringue
 - mix water (85 g), egg white protein powder and citric acid with an electric whisk at speed 1 (electric whisk reference: Philips Cucina HR 1560/63) for 45 s.
 - mix again with the electric whisk at speed 2 for 45 s.
 - add the sugar and mix again with the electric whisk at speed 1 for 45 s.

2. Part 2: Emulsion
 - mix water (45 g) and sunflower oil with a whisk.
 - add agar powder and mix again.
 - add lecithin powder and mix again.
 - add salt, food colouring and food flavourings and mix the mixture again.
3. Incorporate the meringue into the emulsion in three batches
4. Add starch powder by gently folding the batter with a spatula.
5. Pour the batter in a half-sphere shaped silicone mould and heat it in the microwave twice for 30 s at 800 W.

4. Tomato emulsion-gel:

The aim was to reproduce the texture of a tomato flavoured Mediterranean tapenade. To achieve this, the main ingredients chosen were water, sunflower oil, agar and soy lecithin.

Ingredients:

Water: 27.2 g.
Sunflower oil: 51.6 g (Eco Plus)
Agar-agar powder: 0.7 g (Eco Plus)
Lecithin powder: 2.1 g (Louis François, ref 10040, 1245 A)
Smoky food flavouring: 0.3 g (Meilleur du chef, ref fume58)
Red carmin colouring powder: a dash (Meilleur du chef, ref crc20p15).
Salt: 1 g
Tomato flavouring: 0.7 g (Meilleur du chef, ref toma58).

Process:

1. Mix water, sunflower oil, lecithin and agar together until complete homogenization.
2. Add food flavourings, food colouring and salt. Mix again.
3. Heat the mixture in the microwave twice for 30 s at 800 W.
4. Refrigerate for a few hours. Two phases are observed.
5. Pour the mixture into a filter and collect the solid phase : this is the tomato emulsion. The second phase corresponds to a non-coloured oily liquid phase that is not retained during this



Figure 1. From top left to bottom right: the gelatin shell, gelatin shell with the caseinate sauce, gelatin shell with the caseinate sauce and the cake, gelatin shell with the caseinate sauce, the cake and the tomato emulsion-gel, the dish with a spoon trace of tomato emulsion-gel.

stage. This oil can be used for another component of the dish.

The dish was plated as follows (Figure 1):

1. The dried gelatin shell is placed in the middle of the plate
2. The caseinate sauce is poured in the gelatine shell.
3. Using a round cookie cutter, the centre of the cake is removed, the ring obtained is placed on the gelatine shell, the rest of the cake will be latter placed on the side of the shell.
4. One teaspoon of the tomato emulsion-gel is added at the centre of the cake ring.
5. The dish is dressed with the tomato emulsion, spreading it with a spoon.
6. Finally, some caseinate sauce is added and spread in the same way (Figure 2).

Discussion and Results

In the end result, the gelatin shell adds a crispy element to the dish. Additionally, by adding bacon flavour to the shell, the result resembles bacon crisps, which was our objective. Regarding the caseinate sauce, its purpose was to have a mild element similar to that of dairy cream and this was indeed the result obtained. The cake is also very airy, and its texture is homogeneous but slightly squishier than desired and has the wanted smoky toasted bread flavour. As for the last element, the tomato emulsion-gel, the final product obtained demonstrates good homogenization and a smooth texture. Moreover, the flavour is quite interesting as it carries a sour note attributed to the tomato flavouring.



Figure 2. The final dish "La vie en rose".

As said in the introduction, to meet the theme of the 11th Note-by-Note Cooking Contest, we chose to create a dish, whose majority of the ingredients

can be extracted from food wastes like food colouring or flavouring. The main issue with these extractions is that none of them allows to

obtain pure compounds at the end of the process. In fact, they are designed to produce extracts containing different molecules. For example, in the case of food colouring, it is challenging to extract only one molecule, e.g., lycopene, from tomatoes. The known methods only enable the extraction of “red compounds”.

- Gelatin shell:

Regarding the gelatin shell, it provides a bacon odor that is released while melting in the mouth.

On an industrial scale, gelatin is obtained from meat by-products, such as bones or skin (Duthen, 2018; Laisse *et al.*, 2019). However, it is also possible to extract gelatin at smaller scale when cooking: the bones of animals are often discarded, while they can release gelatin after thermal treatment with hot water and filtration.

On another note, it could be interesting to improve the recipe by addressing the issue of bubbles: some bubbles tend to appear during the drying step of the process, which affects its aesthetic quality.

- Caseinate sauce:

The second element is the caseinate sauce. The hibiscus infusion allows a change in the sauce colour from white to pink with addition of citric acid by lowering the pH of the sauce. The caseinate sauce obtained has a creamy texture and a mild taste which allows to highlight the other component of the dish.

Its main component is the caseinate powder. This substance can easily be replaced by casein proteins extracted from dairy products such as milk, in particular milk which has turned slightly sour with time but has not grown too spoiled. For its extraction, it is possible to heat the milk with a small amount of acid, such as vinegar or citric acid to coagulate it, and retrieve the caseinate curd formed after straining it with a cheesecloth.

However, its texture could still be improved as it is not entirely homogeneous. To improve this sauce, it would be interesting to achieve a better incorporation of the casein powder by adjusting the process.

- Toast- flavoured cake

The third element of the dish is the toast flavoured cake. The texture and flavour of this cake can be described as spongy and presenting toasted bread notes.

The emulsion can be made using various surfactants. In particular, proteins can be obtained from the juice of canned chickpeas (Shim *et al.*, 2018).

In the same way, grilled bread food flavouring used in the recipe can be extracted from wasted bread such as stale bread. To bring out the toasted odor, the bread can be fried in a pan before being stored in an airtight container covered with solvent (ethanol) for 24 hours (Bennar *et al.*, 2002). After a filtration and evaporation process, a liquid concentrated in toasted bread aroma can be obtained.

Lastly, to improve the recipe, the main focus would be to increase the cake's lightness.

- Tomato-flavoured emulsion-gel

In terms of texture and taste, the tomato emulsion obtained is similar to a tapenade. To extract the tomato odor used in the recipe, an extraction process was proposed using wasted tomatoes. Indeed, according to a study by the Boston Consulting Group (Hegnsholt *et al.*, 2018), vegetables and fruits are the most wasted food category, and one of the reasons is their appearance when harvested. Deformed vegetables and fruits are thrown away even though they are undamaged and edible. This includes tomatoes. Therefore, an alternative to throwing them away is to use deformed tomatoes to extract their odorant compounds by steam distillation (Cassel *et al.*, 2009).

Conclusion

The complexity of the dish discussed here does not prevent it from being harmonious, both visually and in flavour. The range of flavours (tomato, bread, bacon, etc.) combined with the richness and diversity of textures (crunchy, soft, liquid, etc.) allows the creation of a unique dish without straying too far from what the consumer is familiar with. The making of this dish shows

that we could improve the approach to food waste, creating a world where resources are better used. Creativity can help tackle the challenge of food waste by rethinking the way we manage resources.

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