Note by Note “Contemporary Au Gratin”

ADVANCED MOLECULAR GASTRONOMY

D21127093

FIPDes Student

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Introduction

In 1988 the scientific term “Molecular Gastronomy” was created and since then, this science is being developed in many countries around the world. This scientific discipline explores the culinary transformations from raw ingredients to eating the final dish (This, 2005). Its applications are based on two pillars. First of all, there are some molecular applications that are used for molecular cooking in restaurants, homes or even in food industry, since it is a way for food preparation using contemporary tools, ingredients and methods. Secondly, it also has some educational applications in terms of new culinary curricula and educational programs in schools (This, 2009).

Following the Molecular Gastronomy techniques, a new application was revealed in 1994 by French Psychical Chemist and Molecular Gastronomy Co-founder, Hervé This. This application is called “Note by Note” cooking and it does not use traditional food to create a dish but pure compounds instead. “Note by Note” food was initially called synthetic food. It is a food processed and combined by the cook to create all aspects of food, such as shape, consistency, colour, odour, taste, trigeminal sensation, nutritional properties, and temperature (This, 2019). For these recipes, no meat, fish, fruits or vegetables are used, and the actual aim is to re-create foods that already exist but in a way that it will give a new perspective and potentially new flavours. It also makes an important contribution to the fight against spoilage, water, energy, foodstuff and it is really beneficial for environmental protection (Burke and Danaher, 2020).

Famous chefs around the world, such as the three-star Michelin chef Pierre Gagnaire are using “Note by Note” cooking to develop dishes. In addition, this application has been merged in many colleges in different countries, such as Denmark, Portugal and Ireland (Burke and Danaher, 2016).

During this module, the goal was to develop a Note by Note dish that complies with the requirements of the International Note by Note contest that is held annually in Paris, France since 2013 and was an interesting way to stimulate student learning and inspire students to create dishes made only by pure compounds. This instructional exercise is a project-based learning that takes place in Technological University of Dublin and enhances the critical knowledge of the participants and their problem-solving skills (Burke and Danaher, 2018).

Aim of the assignment

According to the topic of the 10th International Contest for Note by Note that we had to base on, the goal was to create dishes that include savoury dice and make use of fibers. My idea came from a French dish called “Potatoes au gratin”. It is also called “Gratin dauphinoise” and is a decadent dish of sliced potatoes baked with cream, grated cheese and dates back to 1788 in the southeastern region of Dauphine in France (Wikipedia, 2022).

Inspired by this dish, I wanted to create a dish made with potato cubes, crispy bacon and cream cheese in a more modern way, combining the knowledge obtained during the Molecular Gastronomy classes and the possibility to use hundreds of pure compounds and different flavours in a professional kitchen. At the same time, I tried to focus as much as I could on creating something that is very close to note by note cooking. The name of the dish was decided to be “Contemporary au gratin” since the French dish was the inspiration for that.

The goal was to present a final result that combines three different levels of texture. The potato cube should give to this dish a texture that resembles the sliced baked potatoes, the cream cheese gives the creamy texture with a flavour that combines goat cheese and the truffle for intensity and the bacon will add crispiness to enhance the mouthfeel in every bite. All these should be efficiently presented in a dish with specific colours to add contrast and improve the acceptability of the final result.

Materials & Methods

The preparation of the dish took place in CQ-LG06 Teaching Kitchen 1 and was supervised by Pauline Danaher, Lecturer in the Department of Culinary Arts at the Technological University of Dublin.

“Contemporary au gratin” consists of 3 different preparations, the potato cube, the cream cheese and the crispy bacon. Table 1 presents the specific amounts of the ingredients the were used for the preparations, their supplier and the product code that comes from the reference site.

Potato cubes				
Ingredient	**Unit**	**Quantity**	**Brand**	**Product Code (Reference)**
Potato powder	g	60	Unilever	Knorr (Knorr, 2022)
Water	mL	300	Tap water	No supplier
Yellow food colouring	mL	0,1	Cake decoration	36050G (Il punto Italiana, n.d.)
Maltodextrin powder	g	240	Sosa Ingredients	38771 (SOSA Ingredients, 2022d)
Fruit pectin NH	g	12	Sosa Ingredients	37850 (SOSA Ingredients, 2022c)
Citric acid	g	3	Louis François	(Louis Francois, 2014)
Salt	g	1	Musgrave Marketplace	639444 (Musgrave Marketplace, n.d.)
White ground pepper	g	1	Verstegen Spices & Sauces	94165 (Verstegen Spices & Sauces, 2022)
Cream cheese				
Ingredient	**Unit**	**Quantity**	**Brand**	**Ref Code and Source**
Natural aroma goat type cheese	g	9	Sosa Ingredients	38988 (SOSA Ingredients, 2022b)
Egg white powder	g	45	Sosa Ingredients	38461 (SOSA Ingredients, 2022a)
Maltodextrin powder	g	90	Sosa Ingredients	38771 (SOSA Ingredients, 2022d)
White truffle flavor	mL	0,05	Sosa Ingredients	Number 79-4660001 (SOSA Ingredients, 2019)
Salt	g	0,1	Musgrave Marketplace	639444 (Musgrave Marketplace, n.d.)
Water	mL	108	Tap water	No supplier
Green food colouring	mL	0,05	Cake decoration	36050VM (Il punto Italiana, n.d.)
Crispy Bacon				
Ingredient	**Unit**	**Quantity**	**Brand**	**Ref Code and Source**
Wheat flour	g	70	Odlums	(Odlums, 2022)
Beetroot spray dried powder	g	0,2	MSK Ingredients	MSK-8158 (MSK Ingredients, 2021)
Smoked bacon flavour	mL	0,05	MSK Ingredients	MSK-7822 (MSK Ingredients, 2021)
Sunflower oil	mL	100	Musgrave Marketplace	770924 (Musgrave Marketplace, n.d.)
Salt	g	1	Musgrave Marketplace	639444 (Musgrave Marketplace, n.d.)
Water	mL	37	Tap water	No supplier

Table 1: Ingredients' amount for the 3 preparations.

The equipment and utensils that were used for these preparations are described in Table 2. For the equipment, the supplier is also provided.

Equipment	Supplier
Digital kitchen scale (1 g graduation)	Soehnle
Digital pocket scale (0,01 g graduation)	Triton T3
Hob	Electrolux
Fridge	Coolhead
Thermomix	Vorwerk Slowcooker TM31
Utensils	
(Supplier is not provided)	
Stainless steel bowls for ingredients measurement	
Stainless steel pot for the potato cubes mixture	
Plastic trays for ingredients needed in small quantity	
Whisk for mixing	
Pan for frying the bacon mixture	
Spoons for powders measurement	
Plastic moulds for cubes shape	
Skimmer for removing bacon from frying oil	
Eye dropper for adding the liquid flavours	

Table 2: Equipment and utensils used for the dish.

The method is described below and all the ingredients were prior weighed and put either in stainless steel bowls or plastic trays.

Potato cubes:

1. The pectin is mixed with the maltodextrin powder in a bowl.
2. In another bowl all the other ingredients (potato powder, water, yellow food colouring, salt, pepper) except for the citric acid, are mixed.
3. The mixtures are merged and brought to boil.
4. After boiling, the citric acid is added
5. The mix is molded in a plastic mold and placed in the chiller until a gel is formed.

Cream cheese:

1. All the ingredients are mixed with a whisk until they create a cream.
2. The mixture is rested in the fridge for 20 minutes before serving.
3. In the half of the mixture, green food colouring is added before putting it in the fridge.

Crispy bacon:

1. All the ingredients are mixed by hand until they form a homogenous dough.
2. The dough is shaped in stripes.
3. The dough is fried in sunflower oil for approximately 3 minutes until it forms a crispy surface.
4. Some of the fried dough parts are smashed in the Thermomix to create a powder.

The ingredients used for each preparation are shown in Figure 1 and the preparations in Figure 2.

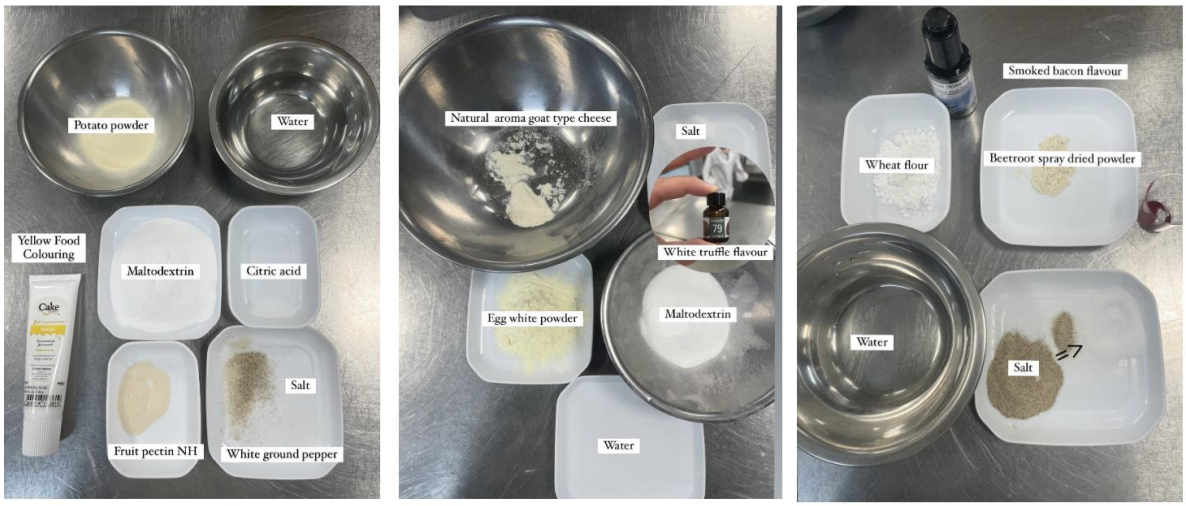

Figure 1: Ingredients for potato cubes (left), cream cheese (middle) and crispy bacon (right).

Figure 2: Potato cubes in molds (left), cream cheese in the whipping step (middle), crispy bacon's dough preparation (right).

Results

The preparations made as described above and a dark grey plate was used for the final presentation. Firstly, the potato cube was emerged in the cream cheese and put in the middle of the plate. On the top a bacon crisp was put. On the one side of the dish the green-coloured cream cheese was put in a circular shape, while on the other the bacon powder. The final result is shown in Figure 3.

Figure 3: The final dish.

In the end of the session, it was decided that we have to perform a sensory evaluation with the other students of the same kitchen as participants. Due to the time limit, I had only time to perform an informal sensory test and keep notes with the comments the participants made for my plate.

The informal sensory evaluation that took place among the students of the CQ-LG06 Teaching Kitchen gave very good results, since the comments about the appearance were really encouraging. Regarding the texture, most of the people that tried the plate, mentioned that they liked the contrast in texture between the potato cube that was quite stable, the cream cheese that had a creamy texture and the bacon stripe and powder that were crispy.

Finally, the taste was claimed to be good to very good if we take into account the comments we had.

Discussion

In order to end up with these results, that are following the Note by Note guidelines and receive good comments in terms of texture and appearance, there was research conducted for the selection of the raw materials that can be used and give the expected result in the short period of time we had and at the same time comply with the regulation. In the following paragraphs, the selection of the raw materials for each preparation will be analyzed and the compliance with the regulation will be validated.

Regarding the potato cubes, the maltodextrin is used in our case as a bulking agent and is pre-blended with the pectin that is a hydrocolloid to achieve a proper dispersion (Burke et al., 2017). Pectin was chosen as one of the contest's requirements was to create a dish with fibers and due to its ability to form clear gels in sour foods with a high sugar content (Burke et al., 2017). Potato powder was chosen instead of methional oil that was not available in the kitchen at this time. The powder gave the characteristic potato flavour to the dish, as for the colour, yellow food colouring was chosen. Water was added to humidify the mixture and salt and pepper to enhance the taste. The citric acid was one of the major components since the addition of acid in the pectin-gelatin composition reduces the pH, the solubility of pectin and accelerates the formation of jelly. This is due to the fact that in the presence of citric acid reduced the degree of dissociation of galacturonic acid (Musabekov et al., 2015).

Maltodextrin was added for the same reason for the cream cheese since it acts as a bulking agent. Regarding the egg white powder, it is an ingredient that can be used in any aqueous liquid, regardless of its pH and it is suitable for mousses, since the goal was to have a creamy texture. It allowed us to whip the aqueous liquid in a stable way (SOSA Ingredients, 2022a). The natural goat aroma goat type cheese was chosen to give the cheese flavor, which was enhanced by the addition of white truffle flavour. The mixture was divided in two parts and in the one green food colouring was added to give a colour contrast in the final dish.

For the crispy bacon, the idea to use wheat flour was based on the fact that this type of flour has lower amount of gluten. In addition, when the starch granules are hydrated, and

initially heated in the oil, they can swell and thus the starch molecules are allowed to move and separate from one another. As the water is driven away during the frying step, these molecules lock into place and form a rigid, brittle network with a porous, open structure. Furthermore, the two types of starch molecules (amylose and amylopectin) form some cross-links with one another at high frying temperatures, further reinforcing the coating's structure. Thus, the molecules in this porous network have room to compress and fracture, providing the sensation of crispiness (America's Test Kitchen, 2017). The smoked bacon flavour and the beetroot spray dried powder were added to resemble the flavour and the colour of the bacon respectively, while the salt was used to give taste.

Regarding the usage of additives, in the recipe citric acid (E330) and Fruit pectin NH (E450i) are used. For both of them, according to the Regulation (EU) No 1129/2011, the maximum level is prescribed as "quantum satis" and as a result there is no limit in the quantity of the additive that we can add (Regulation (EU) No 1129/2011, 2011)

Finally, regarding the two flavours that were used, smokey bacon and white truffle, we assume that since their usage was in accordance with the supplier's instructions and the suppliers are European companies, the 0,05 mL that was added from each one complies with the existing regulation (Regulation (EU) No 872/2012, 2012). However, even the flavours used are supposed to be natural, further examination should be done by using the specifications' sheets to confirm that the purity of these compounds follows the regulation's guidelines.

Conclusion

The concept was based on the Note by Note 10th contest that has the topic "Savoury dice with fibers". The creation of the "Contemporary au gratin" respects all the guidelines given and is close to a note by note dish if we take into account that we had only 4 trials in the kitchen with very specific ingredients. In terms of appearance and taste, it gave very good results when it was evaluated orally by other participants.

Further corrections could be made if more time was given, especially in terms of the purity of the compounds. For example, the potato powder and the beetroot spray dried powder could be replaced with note by note ingredients to be closer to the initial goal.

Finally, it is a good dish that has achieved the goal of "cube and fibers" and thus it can compete other dishes in the 10th International Contest for Note by Note cooking.

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Logbooks

MODULE CODE: TFCS9025

MODULE TITLE: Advanced Molecular Gastronomy

STUDENT NAME: Kyriaki-Eirini Moschou

FOOD PRODUCT: Contemporary Au Gratin **DATE: 28/03/2022**

Weekly Aims and Objectives

Aim: Creating a note by note Au Gratin, with potato cubes containing fibres, crispy bacon and cream cheese.

Objectives:

Trying to work on potato cubes to ensure that I can end up with the derided shape using the current recipe and on the cream cheese to evaluate the texture and the taste.

Materials and Method

The table below shows the ingredients with their quantities that were used during the first trial:

Potato cubes		
Trial 1 - 28/03/2021		
Ingredient	**Unit**	**Quantity**
Potato powder	g	10
Water	mL	50
Yellow food colouring	drop	1
Maltodextrin powder	g	40
Fruit pectin NH	g	2
Citric acid	g	0,5
Salt	g	0,3
White ground pepper	g	0,15

Cream cheese		
Trial 1 - 28/03/2021		
Ingredient	**Unit**	**Quantity**
Natural aroma goat type cheese	g	1
Egg white powder	mL	5
Maltodextrin powder	drop	10
Salt	g	1

Water	mL	12

Table 1: Ingredients amount for the first trial.

The following equipment was used during the experiment:

- Digital kitchen scale (Soehnle, 1 g graduation)
- Digital pocket scale (Triton T3, 0,01 g graduation)
- Stainless steel bowls
- Stainless steel pot
- Plastic trays
- Whisk
- Pot
- Spoons
- Plastic moulds for cubes shape
-

Potato cubes:

The pectin was mixed with the maltodextrin in one bowl. In another bowl all the other ingredients were mixed. The mixtures were merged and brought to boil. After boiling, the citric acid was added, and the mix was molded in a plastic mold until a gel was formed.

Cream cheese:

All the ingredients were mixed until they created a cream.

Results and discussion

Regarding the cubes, they gave a good texture and they gave a good shape after moulding. The taste was more acidic than it was expected and the quantity prepared was not enough to make a big cube that was the initial idea. The figure 1 on the left shows the results obtained for the potato cubes after the first trial. The cream cheese, as it appears on the right of the figure, gave good results, as in the end it was homogenous and tasty and does not require important corrections in the next steps.

Figure 2: Potato cubes (left) and cream cheese (right).

Conclusions

For the preparation of the potato cubes, the triple quantity of the ingredients should be weighted in order to mould it properly and obtain well shaped cubes. The citric acid should be decreased because it cover all the other tastes that are important in potato cubes. The cream cheese can be kept as it is, but before serving it would be ideal to keep it resting.

Recommendations for the following trial

In the following trial, all the preparations of the recipe will be made. Starting with the potato cubes and after fixing the acidity, the main scope will be to obtain a perfect cube. Regarding the cream cheese, the same recipe will be followed, but the mixture will be rested for some time, to check in which way it is possible to serve it. Finally, the first trial for the crispy bacon will take place.

All the above will be based on the following recipes:

Potato cubes		
Trial 2 - 01/04/2021		
Ingredient	**Unit**	**Quantity**
Potato powder	g	30
Water	mL	150
Yellow food colouring	drop	3

Maltodextrin powder	g	120
Fruit pectin NH	g	6
Citric acid	g	1,5
Salt	g	0,5
White ground pepper	g	0,5

Cream cheese		
Trial 2 - 01/04/2021		
Ingredient	**Unit**	**Quantity**
Natural aroma goat type cheece	g	3
Egg white powder	g	15
Maltodextrin powder	g	30
Salt	g	0,1
Water	mL	36

Crispy Bacon		
Trial 2 - 01/04/2021		
Ingredient	**Unit**	**Quantity**
Potato starch	g	10
Gluten	g	2,1
Beetroot spray dried powder	g	0,2
Smoked bacon flavour	drop	1
Sunflower oil	mL	100
Salt	g	1
Water	mL	10

Table 2: Ingredients for Trial 2.

MODULE CODE: TFCS9025

MODULE TITLE: Advanced Molecular Gastronomy

STUDENT NAME: Kyriaki-Eirini Moschou

FOOD PRODUCT: Contemporary Au Gratin **DATE: 01/04/2022**

Weekly Aims and Objectives

Aim: Creating a note by note Au Gratin, with potato cubes containing fibres, crispy bacon and cream cheese.

Objectives:

Working on all the preparations needed to create the dish. Starting with the potato cubes and after fixing the acidity, the main scope will be to obtain a perfect cube. Regarding the cream cheese, the same recipe as last week's will be followed, but the mixture will be rested for some time, to check in which way it is possible to serve it. Finally, the first trial for the crispy bacon will take place.

Materials and Method

The table below shows the ingredients with their quantities that were used during the second trial:

Potato cubes		
Trial 2 - 01/04/2021		
Ingredient	**Unit**	**Quantity**
Potato powder	g	30
Water	mL	150
Yellow food colouring	drop	3
Maltodextrin powder	g	120
Fruit pectin NH	g	6
Citric acid	g	1,5
Salt	g	0,5
White ground pepper	g	0,5

Cream cheese		
Trial 2 - 01/04/2021		
Ingredient	**Unit**	**Quantity**
Natural aroma goat type cheese	g	3
Egg white powder	g	15
Maltodextrin powder	g	30

Salt	g	0,1
Water	mL	36

Crispy Bacon		
Trial 2 - 01/04/2021		
Ingredient	**Unit**	**Quantity**
Potato starch	g	10
Gluten	g	2,1
Beetroot spray dried powder	g	0,2
Smoked bacon flavour	drop	1
Sunflower oil	mL	100
Salt	g	1
Water	mL	10

Table 1: Ingredients amount for the second trial.

The following equipment was used during the experiment:

- Digital kitchen scale (Soehnle, 1 g graduation)
- Digital pocket scale (Triton T3, 0,01 g graduation)
- Stainless steel bowls
- Stainless steel pot
- Plastic trays
- Whisk
- Pot
- Pan
- Spoons
- Plastic moulds for cubes shape
- Skimmer
- Eye dropper

Potato cubes:

The pectin was mixed with the maltodextrin in one bowl. In another bowl all the other ingredients were mixed. The mixtures were merged and brought to boil. After boiling, the

citric acid was added, and the mix was molded in a plastic mold and placed in the fridge until a gel was formed.

Cream cheese:

All the ingredients were mixed until they created a cream. The mixture was rested in the fridge for 20 minutes before serving.

Crispy bacon:

All the ingredients were mixed until they formed a homogenous cream. Vegetable oil was put in a pan, until it started boiling. With an eye dropper, drops of the mixture were put in the frying oil until they created a crispy texture and then they were removed with a skimmer

Results and discussion

Regarding the potato cubes, although we obtained a good taste, when the mold was filled up to the top, the final cube was not stable. With the ingredients used, bigger the cube, easier the collapse.

The cream cheese was homogenous, stable and tasty and it does not need further corrections.

Finally, it was the first trial for the crispy bacon. Even the taste was good, the texture after frying was more elastic than crunchy. Thus, it was difficult to "smash" it and decorate the plate with small pieces of bacon. Further corrections are needed to obtain the ideal texture.

Figure 3: Potato cubes (left), crispy bacon (middle), cream cheese (right).

Figure 4: The result of the second trial.

Conclusions

Since, two more trials are left, we have to focus on the cream cheese flavor correction and the improvement of the bacon texture. Regarding the potato cubes, it is important to find a way to make not only bigger but also stable cubes.

Recommendations for the following trial

For the potato cubes, the pectin quantity should be increased in order to obtain a bigger stable cube. Regarding the bacon, gluten should be excluded from the recipe and the potato starch should be replaced with corn starch. For the cream cheese, truffle flavor can be added to enhance the taste.

Potato cubes		
Trial 3 - 04/04/2021		
Ingredient	**Unit**	**Quantity**
Potato powder	g	60
Water	mL	300
Yellow food colouring	drop	6
Maltodextrin powder	g	240
Fruit pectin NH	g	12
Citric acid	g	3
Salt	g	1
White ground pepper	g	1

Cream cheese		
Trial 3 - 04/04/2021		
Ingredient	**Unit**	**Quantity**
Natural aroma goat type cheese	g	3
Egg white powder	g	15
Maltodextrin powder	g	30
White truffle flavor	drop	1
Salt	g	0,1
Water	mL	108

Crispy Bacon		
Trial 3 - 04/04/2021		
Ingredient	**Unit**	**Quantity**
Corn starch	g	10
Beetroot spray dried powder	g	0,2
Smoked bacon flavour	drop	1
Sunflower oil	mL	100
Salt	g	1
Water	mL	10

Table 2: Ingredients amount for the third trial.

MODULE CODE: TFCS9025

MODULE TITLE: Advanced Molecular Gastronomy

STUDENT NAME: Kyriaki-Eirini Moschou

FOOD PRODUCT: Contemporary Au Gratin **DATE: 04/04/2022**

Weekly Aims and Objectives

Aim: Creating a note by note Au Gratin, with potato cubes containing fibres, crispy bacon and cream cheese.

Objectives:

- Increasing the pectin from 18g to 30g in order to obtain a bigger stable potato cube.
- Gluten should be excluded from the bacon and the potato starch should be replaced with corn starch.
- For the cream cheese, truffle flavor can be added to enhance the taste.

Materials and Method

The table below shows the ingredients with their quantities that were used during the third trial:

Potato cubes		
Trial 3 - 04/04/2021		
Ingredient	**Unit**	**Quantity**
Potato powder	g	60
Water	mL	300
Yellow food colouring	drop	6
Maltodextrin powder	g	240
Fruit pectin NH	g	12
Citric acid	g	3
Salt	g	1
White ground pepper	g	1

Cream cheese		
Trial 3 - 04/04/2021		
Ingredient	**Unit**	**Quantity**
Natural aroma goat type cheese	g	3
Egg white powder	g	15

Maltodextrin powder	g	30
White truffle flavor	drop	1
Salt	g	0,1
Water	mL	108

Crispy Bacon		
Trial 3 - 04/04/2021		
Ingredient	**Unit**	**Quantity**
Corn starch	g	10
Beetroot spray dried powder	g	0,2
Smoked bacon flavour	drop	1
Sunflower oil	mL	100
Salt	g	1
Water	mL	10

Table 1: Ingredients amount for the third trial.

The following equipment was used during the experiment:

- Digital kitchen scale (Soehnle, 1 g graduation)
- Digital pocket scale (Triton T3, 0,01 g graduation)
- Stainless steel bowls
- Stainless steel pot
- Plastic trays
- Whisk
- Pot
- Pan
- Spoons
- Plastic moulds for cubes shape
- Skimmer
- Eye dropper

Potato cubes:

The pectin was mixed with the maltodextrin in one bowl. In another bowl all the other ingredients were mixed. The mixtures were merged and brought to boil. After boiling, the

citric acid was added, and the mix was molded in a plastic mold and placed in the fridge until a gel was formed.

Cream cheese:

All the ingredients were mixed until they created a cream. The mixture was rested in the fridge for 20 minutes before serving.

Crispy bacon:

All the ingredients were mixed until they formed a homogenous cream. Vegetable oil was put in a pan, until it started boiling. The mixture was put in the frying oil until it created a crispy texture and then it was removed with a skimmer. A trial also made by baking the same mixture in the oven.

Results and discussion

This trial showed that the final dish can be created with the ingredients that are chosen. For the plate decoration, two different ways used:

1) Potato cube with crispy bacon on the top and cream cheese on the side

Figure 5: Decoration No1.

Even the taste was good, the final decoration was not attractive because there was not contrast in the plate.

2) Potato cube cut in the middle and stuffed with crispy bacon coated with cream cheese and decorated with a crispy bacon flake on the top

Figure 2: Decoration No2.

This decoration was fancier, especially when someone tried to cut the cube, because it had particles of crispy bacon in the center. Although, the all the manipulations needed to prepare the plate, leaded to an uneven final shape, that should be fixed in case we choose to present the plate in this format.

Conclusions

For the final trial, all the preparations should be made as described in this Logbook. Depending on the time availability, we will decide if we will decorate the plate as it is shown in Figure 1 or Figure 2.

Recommendations for the following trial

Since the next trial is the last one and there is no more time for experimentation, the same recipe will be kept for potato cubes and cream cheese. Regarding the crispy bacon a very quick trial will be made in order to achieve a better and crispier texture.

Potato cubes		
Trial 4 - 25/04/2021		
Ingredient	**Unit**	**Quantity**
Potato powder	g	60
Water	mL	300
Yellow food colouring	drop	6
Maltodextrin powder	g	240
Fruit pectin NH	g	12
Citric acid	g	3
Salt	g	1
White ground pepper	g	1

Cream cheese		
Trial 4 - 25/04/2021		
Ingredient	**Unit**	**Quantity**
Natural aroma goat type cheese	g	9
Egg white powder	g	45
Maltodextrin powder	g	90
White truffle flavor	drop	1
Salt	g	0,1
Water	mL	108

Crispy Bacon		
Trial 4 - 25/04/2021		
Ingredient	**Unit**	**Quantity**
Wheat flour	g	70
Beetroot spray dried powder	g	0,2
Smoked bacon flavour	drop	1
Sunflower oil	mL	100
Salt	g	1
Water	mL	37

Table 2: Ingredients amount for the fourth trial.

MODULE CODE: TFCS9025

MODULE TITLE: Advanced Molecular Gastronomy

STUDENT NAME: Kyriaki-Eirini Moschou

FOOD PRODUCT: Contemporary Au Gratin **DATE: 25/04/2022**

Weekly Aims and Objectives

Aim: Creating a note by note Au Gratin, with potato cubes containing fibres, crispy bacon and cream cheese.

Objectives:

- Preparing the recipe for the potato cubes as it was made in all the previous trials
- Making the cream cheese as usual but keep the half of the mixture aside in order to add green colour to give some contrast in the plate.
- Trying the crispy bacon by mixing 70 g of wheat flour with 37 mL of water, smokey bacon flavor, beetroot powder for the colour and salt to enhance the taste.

Materials and Method

The table below shows the ingredients with their quantities that were used during the fourth trial:

Potato cubes		
Trial 4 - 25/04/2021		
Ingredient	**Unit**	**Quantity**
Potato powder	g	60
Water	mL	300
Yellow food colouring	drop	6
Maltodextrin powder	g	240
Fruit pectin NH	g	12
Citric acid	g	3
Salt	g	1
White ground pepper	g	1

Cream cheese		
Trial 4 - 25/04/2021		
Ingredient	**Unit**	**Quantity**
Natural aroma type cheese	g	9
Egg white powder	g	45
Maltodextrin powder	g	90

White truffle flavor	drop	1
Salt	g	0,1
Water	mL	108
Green food colouring	drop	1
Crispy Bacon		
Trial 4 - 25/04/2021		
Ingredient	**Unit**	**Quantity**
Wheat flour	g	70
Beetroot spray dried powder	g	0,2
Smoked bacon flavour	drop	1
Sunflower oil	mL	100
Salt	g	1
Water	mL	37

Table 1: Ingredients amount for the fourth trial.

The following equipment was used during the experiment:

- Digital kitchen scale (Soehnle, 1 g graduation)
- Digital pocket scale (Triton T3, 0,01 g graduation)
- Stainless steel bowls
- Stainless steel pot
- Plastic trays
- Whisk
- Pot
- Pan
- Spoons
- Plastic moulds for cubes shape
- Skimmer
- Eye dropper

Potato cubes:

The pectin was mixed with the maltodextrin in one bowl. In another bowl all the other ingredients were mixed. The mixtures were merged and brought to boil. After boiling, the citric acid was added, and the mix was molded in a plastic mold and placed in the fridge until a gel was formed.

Cream cheese:

All the ingredients were mixed until they created a cream. The mixture was rested in the fridge for 20 minutes before serving. In the half of the mixture, green food colouring was added before putting it in the fridge.

Crispy bacon:

All the ingredients were mixed until they formed a homogenous dough. The dough was shaped in stripes in order to resemble bacon. The dough was fried in vegetable oil for approximately 3 minutes until they formed a crispy surface. Some of the fried dough parts were smashed to create a bacon powder that helped in the decoration of the dish.

Results and discussion

The preparations that made as described above, were easily handled to create this dish. Firstly, the potato cube was emerged in the cream cheese and put in the middle of a black plate. On the top a bacon crisp was put. On the one side of the dish the green-coloured cream cheese was put in a circular shape, while on the other the bacon powder.

Figure 6: The final dish.

The informal sensory evaluation that took place among the students of the CQ-LG06 Teaching Kitchen gave very good results, since the comments about the appearance were really encouraging. Regarding the texture, most of the people that tried the plate, mentioned that they liked the contrast in texture between the potato cube that was quite stable, the cream

cheese that had a creamy texture and the bacon crisp and powder. Finally, the taste was claimed to be good to very good if we take into account the comments we had.

Conclusions

The goal of creating a plate with “Savoury dice and fibers” was accomplished. The dish is quite close to pure note by note and the flavour is evaluated as good. All these parameters make it possible for this plate to participate in the 10th International Contest for Note by Note cooking.