



Erasmus Mundus Joint Masters Food Innovation and Product Design
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Advanced Molecular Gastronomy

***‘SPLENDOUR IN THE SCRAPS’*: A NOTE BY NOTE COOKING
PERSPECTIVE ON FOOD WASTE**

Natália Silva Câmara

Supported by Pauline Danaher and Roisin Burke

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1. INTRODUCTION

The worldwide food waste crisis is a growing concern, with an estimated 59 million tonnes of food waste generated annually in the EU alone, valued at 132 billion euros (Eurostat, 2022). This equates to roughly 10% of food made available to EU consumers being wasted, while 36.2 million people in the EU cannot afford a quality meal every second day (Eurostat, 2020). In Ireland, 770.316 tonnes of food waste was generated in 2020 (Environmental Protection Agency, 2022). This has significant economic and environmental consequences, as well as ethical concerns given the number of people who go hungry every day. To combat this issue, chefs and food scientists are exploring new ways to reduce food waste and promote sustainable food practices.

One approach gaining popularity is the use of molecular gastronomy and note-by-note cooking techniques. According to Dr. This (2014), these techniques can create more sustainable food that does not require refrigeration and could be the solution to the food waste issue, while also providing new culinary possibilities. By using these innovative approaches, chefs can transform food scraps and leftovers into delicious and sustainable meals.

This report explores the application of these techniques to address the issue of food waste. A note-by-note dish was developed using seven aspects: Reduction, Redistribution, Recovery, Repurposing, Retention, and Resourcefulness. Together, this dish, named "*Splendour in the Scraps*", enhances the flavors, aromas, and textures of remnant food in a practical way.

2. AIM

To design a new innovative Note by Note dish made out with pure compounds by using the knowledge acquired from Advanced Molecular Gastronomy classes and from bibliographic research in order to access a Food Waste perspective for the 11th International Contest for Note by Note Cooking.

3. A PERSPECTIVE ON MOLECULAR GASTRONOMY

Molecular gastronomy is an academic discipline that analyses the physical and chemical processes that occur while cooking and eating. This area tries to comprehend the fundamental concepts behind culinary procedures and to use this knowledge in the creation of new and unique foods. Starting from 1995, a group of French molecular gastronomists have been advocating for the development of this discipline in France (This, 2011), and Hervé This, a French physical chemist, was one of the first to introduce the concept of Molecular Gastronomy in 1988. He defined this field as "*the investigation of*

the mechanisms of phenomena that occur during the preparation and consumption of food" (This, 2002).

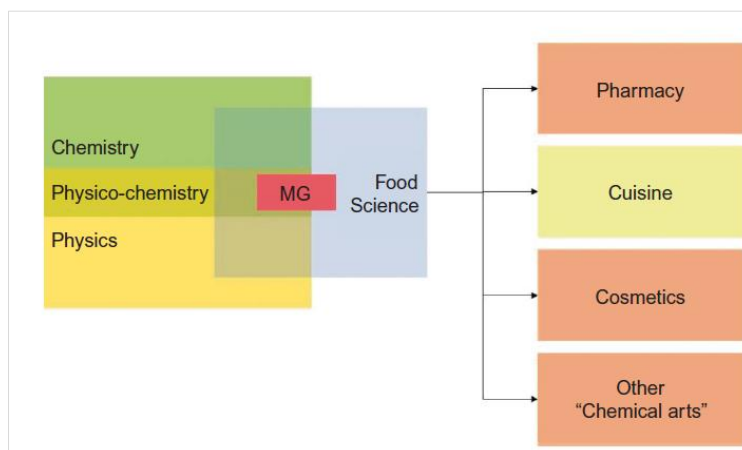


Figure 1. *Molecular gastronomy applications (This, 2011)*

The application of scientific methodologies and procedures to study and modify food components is one of the core ideas of molecular gastronomy. This entails extracting and isolating certain tastes, textures, and scents from food using tools such as centrifuges, rotary evaporators, and liquid nitrogen (This, 2006). Furthermore, the utilization of ingredients and procedures that question traditional culinary traditions is another significant feature of molecular gastronomy. This, for example, has experimented with employing unusual ingredients such as edible paper and egg yolk spaghetti, as well as processes such as spherification to produce distinct textures and presentations (This, 2005).

In Ireland, Molecular Gastronomy is a newer field, although it has gained popularity in recent years. Some chefs and restaurants are incorporating molecular gastronomy methods and ingredients into their menus, resulting in new meals for guests to enjoy. Some academic institutions, such as the Technological University of Dublin, have been offering molecular gastronomy courses as part of their culinary arts curriculum, assisting in the training of the future generation of chefs in this sector (TU Dublin, 2023).

As a whole, molecular gastronomy has the potential to transform the culinary world by giving chefs an in-depth knowledge of the science underlying cooking and eating, as well as enabling them to produce new and fascinating dishes that challenge traditional cuisine. According to This (2013), *"the goal of molecular gastronomy is to make the kitchen a laboratory for the senses, to stimulate creativity, and to inspire innovation in cooking"*.

4. A PERSPECTIVE ON NOTE BY NOTE COOKING

Note by Note cooking was pioneered by Herve This, a French physical scientist and co-founder of Molecular Gastronomy. In his book "Molecular Gastronomy: Exploring the Science of Flavor," he presents Note by Note cooking as a method of creating new meals exclusively from pure compounds or mixes of pure compounds, rather than depending on traditional components such as meat, fish, fruits, or vegetables (This, 2006). This sees Note by Note cooking as a way to explore the potential for new flavors and textures in cooking. By using pure compounds, chefs can manipulate the sensory aspects of food, such as taste, aroma, texture, and color, to create entirely new dishes and experiences (This, 2014).

Furthermore, Note by Note cooking has substantial implications for food business sustainability. Chefs may design recipes that use less resources, such as land, water, and energy, and can decrease food waste by utilizing only the essential components by employing pure chemicals (This, 2014). The area is also highly valuable tool in culinary education as it encourages students to think outside the box and stimulates their creativity (Burke and Danaher, 2016).

Note by Note cooking is becoming increasingly popular in Ireland. Since 2013, students at Technological University Dublin have been producing Note by Note dishes, with several of them taking first place in the student category of the Note by Note competition in Paris (Margot, 2023).

5. THE ISSUE OF FOOD WASTE

Food waste is a major global issue. It occurs at all stages of the food supply chain, from production to consumption and it has ramifications for the environment, economy, and society. According to recent estimates, one-third of all food produced in the world is wasted, amounting to 1.3 billion tons each year (FAO, 2019). This problem has serious environmental consequences, including contributing to greenhouse gas emissions and climate change. When food waste decomposes in landfills, it emits methane, a strong greenhouse gas that is far more dangerous than carbon dioxide (Environmental Protection Agency, 2021).

Also, food waste has economic repercussions in addition to environmental effects. The United States, for example, spends an estimated \$218 billion per year on harvesting, preparing, shipping, and disposing of food that is never eaten (ReFED, 2019). Furthermore, food waste has societal consequences as well since it adds to hunger and food insecurity. According to the United Nations Food and Agriculture Organization, roughly 820 million people worldwide suffer from hunger, while another 2 billion are food insecure (FAO, 2021). In Ireland,

This issue is also deeply correlated with Sustainable Development Goal (SDG) 2, Zero Hunger, that aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture by 2030 (United Nations, 2022). Reducing food waste is essential for achieving SDG 2 because it can help to increase the availability and accessibility of food for those in need. By reducing food waste, food that would otherwise be discarded can be redirected to those who are hungry, addressing both food waste and hunger simultaneously. Fortunately, in recent years, food waste reduction efforts have gained traction. Some nations, including France and Italy, have passed legislation to avoid food waste, while others have started public awareness campaigns and programs to decrease food waste in homes and companies (World Resources Institute, 2020).

Restaurants are one area where significant progress can be made in reducing food waste. According to a recent study by the Irish Environmental Protection Agency, the hospitality sector, including restaurants, is responsible for over 250,000 tonnes of food waste per year (Environmental Protection Agency Ireland, 2018). This sector must evaluate actions to mitigate food waste immediately by implementing portion control measures, improving inventory management, and using up leftover ingredients creatively.

In addition, technology has helped to reduce food waste. Food-sharing applications like Too Good to Go, for example, are assisting in connecting customers with extra food from restaurants and supermarkets, minimizing food waste while offering inexpensive food to people in need (Too Good to Go, 2023). Overall, managing food waste is critical for accomplishing sustainable development goals, safeguarding the environment, and providing universal food security.

6. 'SPLENDOUR IN THE SCRAPS' CONCEPT

"*Splendour in the Scraps*" is a unique and innovative dish created for a Note by Note contest, where pure compounds were used to create a one-of-a-kind flavor experience. The dish was born from the idea that the European Union wastes more food than import, which damages EU food security amid the cost-of-living crisis (Feedback EU, 2022). Moreover, according to a research made by Aldi Ireland (2022), fresh vegetables are the second most discarded item in households. Given that, the idea of this dish was to combine several scraps from common vegetables, such as carrot, tomato and celery and combine that to create a dish that would transform the perception of wasting food.

The dish features a carefully crafted combination of pure compounds, each selected for their unique flavors and aromas. These compounds are blended together to create a mix of taste and texture. Each component of this dish represents one aspect towards Food Waste: Reduction, Redistribution, Recovery, Repurposing, Retention, and Resourcefulness. The six steps of this dish are:

1. Carrot peel crisp
2. Celery tuile
3. Cheese snow
4. Encapsulated olive oil
5. Tomato fluid gel
6. Vegetable cake

Together, these components and aspects assemble the power of creativity and innovation in the culinary world by transforming ingredients commonly discarded into a dish that is both delicious and sustainable.



*Figure 2. Six aspects of “Splendour in the Scraps” dish
Made by Author*



*Figure 3. Logotype of “Splendour in the Scraps”
Made by Author*

7. MATERIALS AND METHODS

7.1. Materials

7.1.1. Ingredients

Table 1. List of ingredients for Note by Note dish

Ingredients	Dosage (%)	Weight (g)
Celery tuile		
Water	65	40
Olive oil	24	15
Cornflour	8	5
Green food colouring	1	0.5
Celery flavour	2	1
Total	100	61.5
Tomato fluid gel		
Water	53	60
Tomato powder	35	40
Sparkling sugar	11	12.5
Agar powder	1	1.5
Total	100	114
Cheese snow		
Water	48	50
Parmesan cheese powdered	48	50
Lecithin	4	4.5
Total	100	104.5
Encapsulated olive oil		
Isomalt	93	100
Olive oil	5	5
Water	2	2
Total	100	107
Carrot peel crisp		
Carrot peel	83	40
Olive oil	13	6
Salt	2	1
White pepper	2	1
Total	100	48
Vegetable cake		
Vegetable scraps	56	40
Water	42	30
Xanthan gum	1	0.5
Salt	1	0.5
Lysine	1	0.5
EAA mix	1	0.5
Total	100	72

7.1.2. Equipment

- ✓ 4 pots
- ✓ 3 wooden spoons
- ✓ 3 bowls
- ✓ 1 silicone mat
- ✓ 1 squeeze bottle
- ✓ 1 peeler
- ✓ 1 metal cutter
- ✓ 1 strainer
- ✓ 1 container
- ✓ 1 cookie sheet
- ✓ Parchment paper
- ✓ 1 non-stick pan IKEA© 24cm
- ✓ 1 kitchen thermometer Lacor 62459 Electric Probe 1 per Case
- ✓ 1 weighing scale Brand Kabalo Model A
- ✓ Electrolux SkyLine Premium Oven (Equipment Asset tag: 44218/SDXCQ1 14354)
- ✓ Hand mixer Robot Coupe (MP 450 ULTRA) 34811L STICK BLENDER

For more referencing regarding each ingredient and equipment check Annex 1 and 2.

7.2. Methods

7.2.1. Celery tuile

Add 90g of water into a bowl. Add 10g of flour. Add green food colouring. Add celery flavour. Whisk until smooth. Cover a non-stick pan with canola oil up to 1 or 2mm and heat it up. Pour a small amount of mixture into hot oil. Cook it until bubbles subside and appearance is matte. Place tuile on paper towel. Serve.

7.2.2. Tomato fluid gel

Add 300ml of water into a pot. Add 100g of tomato powder. Mix it vigorously. Add 25g of sparkling sugar and simmer until soft. Add 3g of agar powder and bring to boil for 1-2 minutes. Strain and transfer to a container. Refrigerate it for 1 hour. Use thermomixer on high until smooth. Transfer to a squeeze bottle and serve.

7.2.3. Cheese snow

Add 200g of water and 200g of parmesan cheese powder into a pot. Season it with 1g of white pepper and 1g of garlic powder. Mix it well and slowly bring to boil. Add soy lecithin and cook it for 5 more minutes. Transfer to a bigger pot and let it cool. Then make bubbles with a hand mixer. Transfer the bubbles to a container and put it into freezer for 2 hours. Take it out of the fridge and serve.

7.2.4. Encapsulated olive oil

Add 200g of isomalt into a pot and add a little bit of water. Cook on medium-low heat until it reaches 165°C. Then, remove it from the heat and set aside to cool down to 140°C. Place some olive oil into a squeeze bottle and lay out a silicon mat. Dip a metal cutter into the pan and gently remove it so there is a clear thin layer of the isomalt across. Then, immediately take the squeeze bottle and pour some olive oil into it so the isomalt will encapsulate the olive oil. Serve.

7.2.5. Carrots peels crisp

Preheat oven to 200°C. Peel carrots, then slice into 40g of carrot peel strips using the vegetable peeler – the thicker the pieces, the better. Add the carrot strips to a bowl and add 6g of olive oil. Place carrot peelings in a single layer on the parchment paper, and sprinkle with salt. Bake for 10-20 minutes until crispy, tossing once or twice during cooking. (Exact cook time will depend on the thickness of the slices).

7.2.6. Vegetable cake

Gather the vegetable scraps and clean them thoroughly. Using a food processor or blender, pulse the vegetable scraps until they are finely chopped. In a small bowl, mix together 0.5 grams of xanthan gum, 0.5 grams of sodium chloride, 0.5 grams of lysine, and 0.5 grams of essential amino acids mix (eaa mix). This will be the seasoning mix. Add the seasoning mix to the vegetable scraps and mix well to combine. Slowly add 50 ml water to the mixture, stirring constantly, until the mixture forms a thick batter. Heat a non-stick skillet over medium-high heat. Using a spoon or cookie scoop, scoop the vegetable batter onto the skillet, pressing down gently to form a cake. Cook the cakes for 2-3 minutes on each side, until golden brown and cooked through.

7.3. Microscopy

To evaluate the dish structure, Skybasic digital microscope was used and provided clear, detailed images at up to 1000x magnification. It also has LED lights to provide the necessary illumination for

the observations. The microscope is compatible with an app called Max-see, which was used to perform the evaluations. The object was used in days 2 and 3 of experimentations.

7.4. Colorimetry analysis

Colorimetry analysis is a scientific technique that involves measuring and quantifying the color of a substance or solution. It is based on the principle that every substance absorbs, transmits, or reflects light in a specific way, depending on its chemical and physical properties.

This analysis was carried out by an app called ColorMeter. The device quantifies colours in terms of red, green, and blue. Subsequently, the color readings are converted into the Hunter Lab scale for food through the website Colormine. The Hunter Lab scale comprises several metrics, including "L", which gauges whiteness on a scale where 0 denotes black, 100 denotes white, and 50 denotes middle grey. "A" measures the degree of redness when the value is positive and greenness when negative, whereas "B" measures the extent of yellowness when positive and blueness when negative.

7.5. Plating

A dish's plating refers to how the food is organized and presented on a plate or other serving item. To produce a visually appealing meal, several components such as color, texture, height, and symmetry can be used. The purpose of plating is not just to make the meal seem appealing, but also to improve the flavor and entire dining experience of the person eating it.

The author drew inspiration from books such as "The Science of Cooking: Every Question Answered to Perfect your Cooking" (2017) by Dr. Stuart Farrimond and "Gordon Ramsay's Ultimate Cookery Course" (2012) by Gordon Ramsay for the creation of "*Splendour* in the Scraps". Initially, the author followed a drawing during the first three weeks of trials, as shown in Figure X, which included an onion and bacon foam. However, after several trials, the concept changed and the vegetable cake was added later, which was not included in the original drawing.

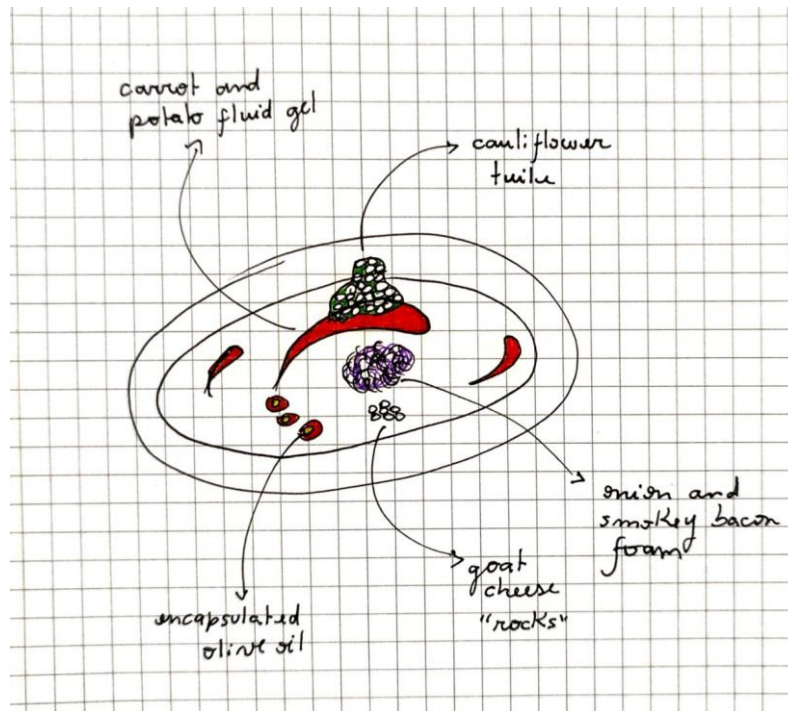


Figure 4. Initial drawing for 'Splendour in the Scraps'

7.6. Sensory analysis

During April 21st, a survey was distributed via the Google Forms platform to evaluate the product. The respondents completed the survey either on the researcher's computer or by using a provided QR code. The sample size comprised 4 participants. The survey included followed by 6 questions. Participants were asked to answer the following questions: 'How much do you think this dish is aligned with the competition guidelines?' (Not at all aligned, somewhat not aligned, not sure, somewhat aligned, very much aligned), 'What do you think about the creativity aspect of this dish?' (Not at all creative, somewhat not creative, not sure, somewhat creative, very much creative), 'How would you rate the overall plating appearance? Closer to 1 indicates a very poor plating appearance and closer to 10 indicates a very good plating appearance', 'How would you rate the overall aroma?' (Dislike extremely, dislike slightly, neither like nor dislike, like slightly, like extremely), 'What do you think about the colour palette?' (Dislike extremely, dislike slightly, neither like nor dislike, like slightly, like extremely), 'How would you rate this dish? Closer to 1 indicates a very poor dish e and closer to 10 indicates a very good dish'.

8. RESULTS

8.1. Dish components

8.1.1. Celery tuile

The final result for the celery tuile can be seen below.



Figure 5. Final celery tuile

8.1.2. Tomato fluid gel

The final result for the tomato fluid gel can be seen below.



Figure 6. Final tomato fluid gel

8.1.3. Cheese snow

The final result for the cheese snow can be seen below.



Figure 7. Final cheese snow

8.1.4. Encapsulated olive oil

The final result for the encapsulated olive oil can be seen below.



Figure 8. Final encapsulated olive oil

8.1.5. Carrot peel crisp

The final result for the carrot peel crisp can be seen below.



Figure 9. Final carrot peel crisp

8.1.6. Vegetable cake

The final result for the vegetable cake can be seen below.



Figure 10. Final vegetable cake

8.2. Microscopy

The microscopy was evaluated on the second of trials. The results can be seen below.



Figure 11. Microscopy for day 2. On the left, the tuile; on the right, the tomato fluid gel

8.3. Colorimetry

After getting the Hunter Lab scale for food through the website Colormine, the colour was exported into the website Colors in which a colour palette was created.



*Figure 12. Splendour in the Scraps colour palette
Made with Colors*

8.4. Plating

The final dish can be seen below.

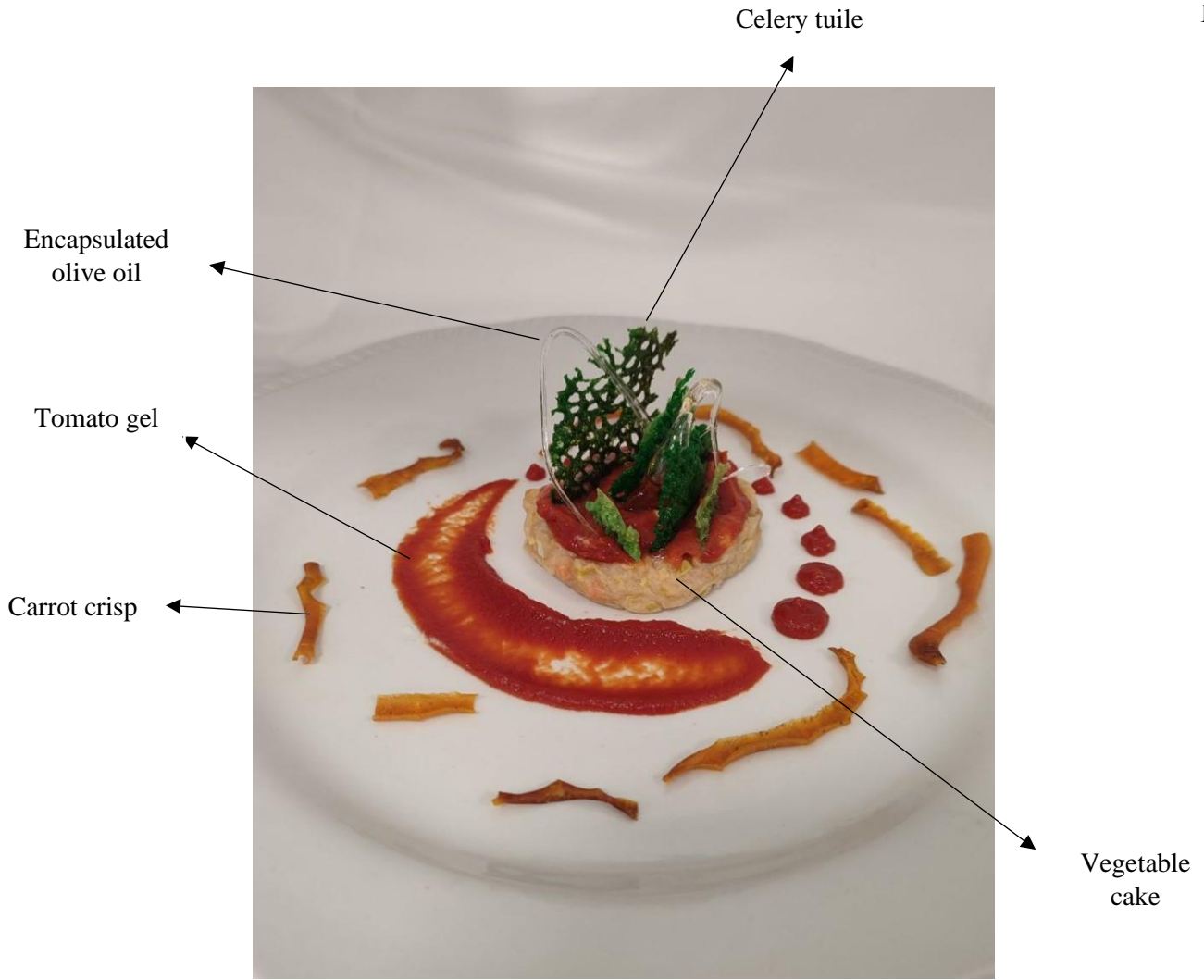


Figure 13. Final dish



Figure 14. Final dish



Figure 15. Final dish

8.5. Sensory analysis

The questions were analyzed descriptively and presented as absolute frequencies. All calculations were performed using a software called JUMP with a 95% confidence interval and relationships with p-values less than 0.005 were considered statistically significant. N represents the number of participants.

Table X. Sensory analysis results

	<i>N</i>	<i>%</i>
How much do you think this dish is aligned with the competition guidelines?		
Not at all aligned	0	0
Somewhat not aligned	0	0
Not sure	0	0
Somewhat aligned	0	0
Very much aligned	4	100
What do you think about the creativity aspect of this dish?		
Not at all creative	0	0
Somewhat not creative	0	0
Not sure	0	0
Somewhat creative	1	25
Very much creative	3	75
How would you rate the overall plating appearance?		
8	2	50
9	2	50
How would you rate the overall aroma?		
Dislike extremely	0	0
Dislike slightly	0	0
Neither like or dislike	0	0
Like slightly	4	100
Like extremely	0	0
What do you think about the colour palette?		
Dislike extremely	0	0
Dislike slightly	0	0
Neither like or dislike	0	0
Like slightly	1	25
Like extremely	3	75
How would you rate this dish?		
8	2	50
9	2	50

Check Annex 3 for the complete graphic results of this evaluation.

9. DISCUSSIONS

9.1. Dish components

9.1.1. Overall dish

Upon reviewing the Logbook section, one will observe that the original idea underwent alterations during its evolution, ultimately leading to the final concept presented here. Initially, the main dish

design varied from the current one because I thought it would be better to add more aspects to address a food waste perspective, and also to give the dish a little bit more structure, so I added the vegetable cake to have a solid aspect to the dish.

The final plating ended up not including the “cheese snow”, because it was melting in the plate. There was also an idea to create an onion and bacon foam, but I could not get the structure right since we only had a few weeks to work on this assignment.

9.1.2. Celery tuile

The main ingredient of this part of the recipe is the cornflour. It serves as a binding agent and contributes to the product's crispiness when fried in hot oil (Elsevier, 2015). During the frying process, the water evaporates slowly, and it forms the crispy tuile.

9.1.3. Tomato fluid gel

In this part of the recipe, each component played a major role in flavor and structure. The tomato powder is a concentrated version of tomato used for flavor, color, and nutritional value. It is prepared by dehydrating and crushing ripe tomatoes into a fine powder. Tomato powder includes phytochemicals such as carotenoids, flavonoids, and phenolic acids, all of which have been linked to health benefits such as antioxidant and anti-inflammatory properties (Domínguez *et al.*, 2020). In this dish, tomato powder was used to address flavour and colour. To hydrate the powder, water was used since it contributes to texture and mouthfeel.

Moreover, agar was used. Agar is a hydrocolloid obtained from seaweed. Because of its capacity to create a stable gel at low concentrations, it is often employed as a gelling agent in food items. Agar gels are thermoreversible, which means they can be melted and reformed again without losing their gelling capabilities. (Pandya *et al.*, 2022). In this recipe, agar helped producing a stable gel matrix providing structure and stability.

Finally, sparkling sugar was used to add texture and flavour to the final product.

9.1.4. Cheese snow

Cheese snow is a culinary ingredient that looks and feels like cheese foam but has a distinct texture. It's commonly created by freezing a cheese, water, and lecithin combination and then scraping it into little flakes or "snow" with a fork or other tool.

In this recipe, the cheese used was the parmesan cheese. Parmesan cheese is a type of hard cheese manufactured from cow's milk. It has a characteristic nutty and salty flavor that is frequently used in Italian cooking. Parmesan cheese has a lot of protein and fat, as well as calcium, phosphorus, and other

minerals (Summer *et al.*, 2017). On the other hand, water is a frequent component in many recipes and is essential in this one. Water has a high surface tension, which causes droplets to form instead of spreading out. This feature is vital in this recipe since it aids in the formation of a stable emulsion between the cheese and lecithin (Provost *et al.*, 2016). At the same time, lecithin was also used since it helps to stabilize the emulsion in this recipe by lowering the surface tension of the water. This distributes the cheese particles uniformly throughout the mixture, resulting in a light and fluffy texture (Waldemar Buxmann *et al.*, 2021).

Together, these ingredients developed a distinct texture that mimics snow. The science underlying this is connected to emulsion characteristics and surface tension. With the aid of lecithin, the cheese and water produced an emulsion. The water's surface tension was lowered, allowing the cheese particles to disseminate uniformly throughout the liquid. As a result, the texture is light and fluffy, similar to snow.

9.1.5. Encapsulated olive oil

The idea of incorporating olive oil into an isomalt capsule was made mostly for the artistic point of view of the dish. Isomalt is a low-hygroscopic substance that is white, odorless, and crystalline in nature. It has a taste that resembles sugar, but it is not as sweet. Its sweetening ability is about 50-60% of sucrose in a 10% solution, but it has a comparable sweetness profile (Caballero, Trugo and Finglas, 2003).

Isomalt can be used to encapsulate items or form a dome in cuisine. From a scientific standpoint, the process incorporates various chemical and physics concepts. When isomalt is heated to a specific temperature, it goes through a process known as sugar caramelization, which allows it to become liquid. At this stage, pour the isomalt into a mold and allow it to cool and solidify into the desired form. It is also critical to comprehend the cooling and solidification of molten isomalt. As the isomalt cools, it transitions from a liquid to a solid state. The isomalt molecules organize themselves into a crystalline structure throughout this phase, which affects the final texture and hardness of the dome (Ziesenitz, 1996).

The olive oil was used to address flavor.

9.1.6. Vegetable cake

Vegetable scraps are an excellent source of fiber, vitamins, and minerals. They were employed to give the cake taste and texture. Moreover, xanthan gum is a food ingredient that serves as a thickener, emulsifier, and stabilizer. By adding viscosity and keeping components from separating, it can aid to improve the texture and structure of the cake (Lopes *et al.*, 2015). Xanthan gum helped to improve

cake mouthfeel by making it moister and softer. The EAA mix and lysine, on the other hand, was added to the cake to boost its protein level and nutritional quality. Finally, the salt was used to enhance the flavor of the cake by balancing sweetness and providing a savoury note.

9.2. Sensory analysis

In this concise study, it was discovered that all of the participants unanimously agreed that the dish was in line with the theme. Furthermore, 75% of the participants described the dish as "highly creative." In terms of overall plating appearance, 50% of the participants rated it a 9 and the other 50% rated it an 8 on a scale from 1 to 10. All of the participants said they slightly enjoyed the overall aroma, while 75% of the participants greatly appreciated the color palette of the dish. Lastly, on a scale from 1 to 10, 50% of the participants rated the dish a 9 and the other 50% rated it an 8.

9.3. Regulation

When dealing with food products that involves food additives and flavouring substances, the major European Union Regulations in which the dish must comply are COMMISSION REGULATION (EU) No 231/2012 of 9 March 2012 laying down specifications for food additives listed in Annexes II and III to Regulation (EC) No 1333/2008 of the European Parliament and of the Council and Regulation (EC) No 1333/2008 of the European Parliament and of the Council of 16 December 2008 on food additives. For each item described in this dish, the specification and alignment is described below.

- Isomalt

E953 Isomalt: The maximum level is *quantum satis* (in latin, as much as is sufficient) for purpose other than sweetening (Regulation EC No. 1333/2008). This dish complies with regulation.

- Xanthan gum

E415 Xanthan gum: The maximum level is *quantum satis* (Regulation EC No. 1333/2008). This dish complies with regulation.

- Agar

E406 Agar: The maximum level is *quantum satis* (Regulation EC No. 1333/2008). This dish complies with regulation.

- Green food colouring

E102 Tartrazine: The maximum level is 100 mg/l or mg/kg as appropriate (Regulation EC No. 1333/2008). This dish complies with regulation since it uses 2 mg/kg.

E142 Green S: The maximum level is 10 mg/l or mg/kg as appropriate (Regulation EC No. 1333/2008). This dish complies with regulation since it uses 0.2 mg/kg.

- Tomato powder

E551 Silicon dioxide: The maximum level is 10000 mg/l or mg/kg as appropriate (Regulation EC No. 1333/2008). This dish complies with regulation since it uses 10 mg/kg.

- Lecithin

E322 Lecithin: The maximum level is *quantum satis* (Regulation EC No. 1333/2008). This dish complies with regulation.

10. CONCLUSIONS

Based on the investigation of molecular gastronomy and note-by-note cooking techniques to address the issue of food waste, it is obvious that these approaches have the ability to produce more sustainable meals while also reducing food waste. Chefs and food scientists, as illustrated in this article, may apply new strategies to turn food wastes and leftovers into tasty and sustainable meals.

The "*Splendour in the Scraps*" note-by-note dish presented in this report demonstrates how cooks may employ the Reduction, Redistribution, Recovery, Repurposing, Retention, and Resourcefulness components to create practical, delectable, and sustainable meals.

In conclusion, this dish is very analogous to what was requested in the guidelines of the 11th International Contest for Note by Note Cooking, and the use of these innovative techniques to address the issue of food waste has the potential to open up new culinary possibilities while also promoting sustainability in the food industry.

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ANNEXES

Annex 1



The image shows a screenshot of a SuperValu online shopping interface. On the left, there is a product image of a yellow and blue Gem Cornflour Tub (250 g). The tub features the 'gem' logo, a 'GLUTEN FREE' badge, and the text 'CORN FLOUR' and 'For perfect sauces and gravy'. On the right, the product name 'Gem Cornflour Tub (250 g)' is displayed, along with the price '€1.99' and '€7.96 per kg'. A green button labeled 'Add to trolley' is positioned at the bottom right of the product card. Above the product name, there is a star icon and the word 'Usuals'.

Figure 16. Cornflour

Taken from SuperValu, 2023



*Figure 17. Green food colouring
Taken from Tesco Ireland, 2023*



Figure 18. Celery flavour



Tomato powder (450g), Sosa

SKU 37865
 Marca: Sosa
 Colección: Extractos Naturales en Polvo
 Familia: Verduras

Tomato powder .

> Formato: 450 g
 Modelo: 47300014

[E-SHOP](#)

Figure 19. Tomato powder

Taken from Sosa, 2023



Sparkling sugar, Sosa

SKU 37716-39030
 Marca: Sosa

With an effervescent texture, sparkling sugar is Peta Crispy Neutral powder. Get surprised with this sugar, an electric explosion in your mouth!

OPTIONS

Code:	Formato:
37716	20 kg
39030	750 g

[E-SHOP](#)

Figure 20. Sparkling sugar

Taken from Sosa, 2023



Agar-agar (500g), Soda

SKU 37872
 Marca: Sosa
 Colección: Gelificantes
 Familia: Texturizantes

Carbohydrate. Type of algae

> **Properties:** Gelling agent.
How to use: Mix in a liquid, bring to a boil and let cool.
Application: Any liquid preparation.
Observations: Heat resistant (90°C), not frozen. Thermo reversible. In acidic media, gels less. Gelatin not very elastic.
Optimal applications: Solid caviar / Hot gelatin <90° C
Other elaborations: Hot foams / Cold foams / Hot gelatin >90° C / Cold gelatin / Cold puree / Veils

Formato: 500 g
 Dosificación: 2-15 g/kg (según grado de dureza deseada)
 Modelo: 58050115

< | >

Figure 21. Agar powder

Taken from Sosa, 2023



Italian cured type cheese Flavouring powder (500g), Soda

SKU 38989
 Marca: Sosa
 Colección: En Polvo
 Familia: Lácteos

Natural Flavouring of Parmesan type cheese powder.


Formato: 500 g
 Dosificación: 2-20 g/kg | Helados: 100 g/kg
 Modelo: 00151520

>

E-SHOP

Figure 22. Italian cheese powder

Taken from Sosa, 2023



Soy lecithin powder, Sosa

SKU 37400-38754
Marca: Sosa

Powdered soy lecithin.

Properties: Emulsio^{ne}. Facilitates the incorporation of air. In excess it can add flavor.

How to use: Mix cold and turbinate introducing air.

Application: Any type of liquid.

Observations: Difficulties with alcohols and certain infusions.

< b>Elaborations: Air / Ice Cream*

OPTIONS

Code:	Formato:
37400	2 kg
38754	400 g

Figure 23. Lecithin

Taken from Sosa, 2023

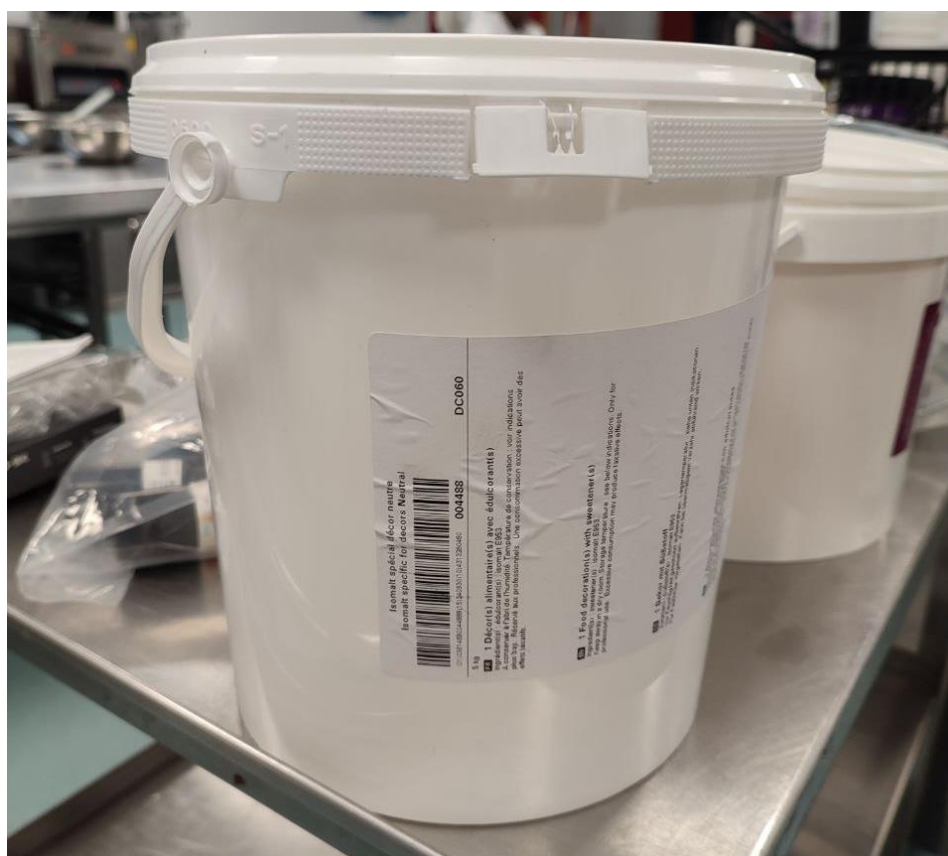


Figure 24. Isomalt



Figure 25. Xanthan gum

L Lysine

100% Pure L-Lysine Amino Acid Powder

[Read More](#)

★★★★☆
160 Reviews

€13.99
€0.14/serving

Vegetarian Vegan Halal

Size

100g 500g 1kg

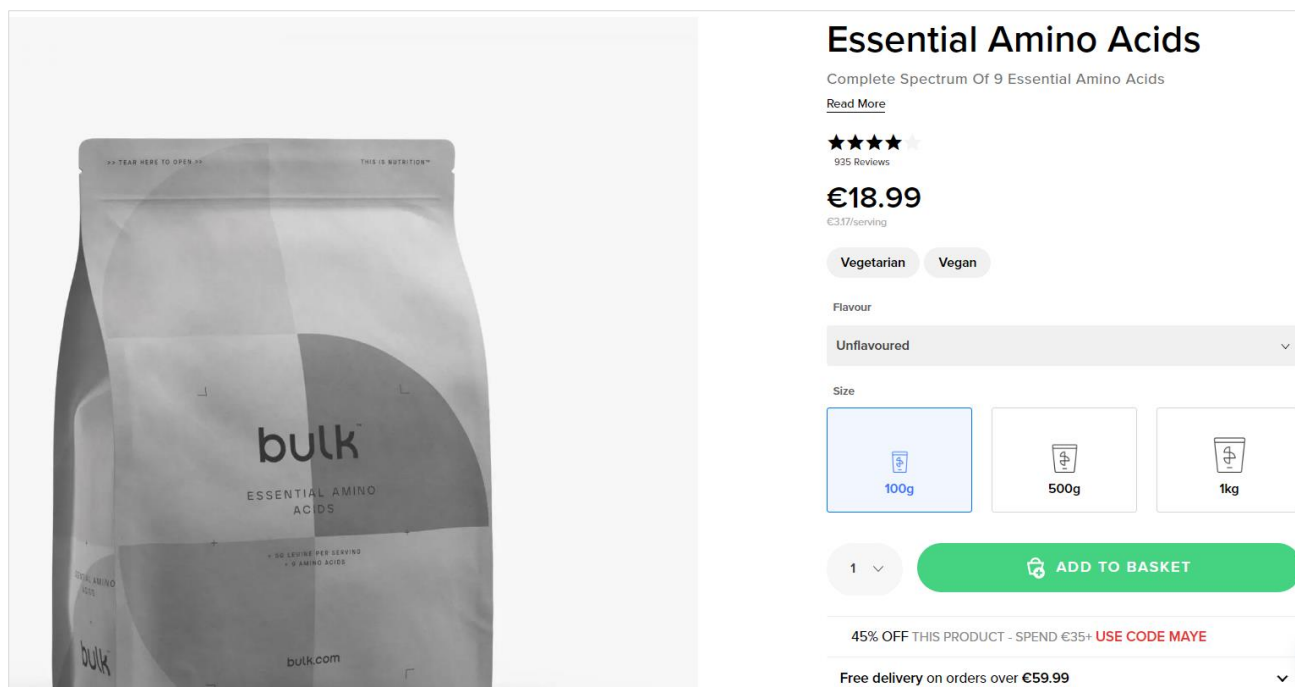
1 [ADD TO BASKET](#)

45% OFF THIS PRODUCT - SPEND €35+ [USE CODE MAYE](#)

Free delivery on orders over €59.99

Choose your way to pay

Figure 26. Lysine
Taken from Bulk, 2023




*Figure 27. EAA Mix
Taken from Bulk, 2023*

Annex 2



Figure 28. Equipment used in Note by Note Contest



Kabalo Black Kitchen Household Food Cooking Weighing Scale 5kg capacity 5000g/1g, Batteries Included! Flat Slim Design, Premier LCD Digital Electronic, with blue backlight

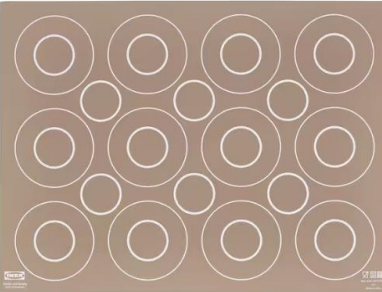

Brand: Kabalo
 ★★★★★ 295 ratings
 Amazon's Choice for "kabalo kitchen scales"

Brand	Kabalo
Colour	black
Weight limit	5 Kilograms
Material	Rubber
Readout accuracy	1g

About this item

- Black Kitchen Scale with non-slip rubber feet, 5000g capacity, 1g

*Figure 29. Weighing scale Kabalo
 Taken from Amazon Ireland, 2023*

BAKTRADITION ♥
 Baking mat, beige, [41x31 cm](#)

€4
 ★★★★★ (0)

Choose colour >
 Beige

How to get it

*Figure 30. Silicone mat IKEA
 Taken from IKEA Ireland, 2023*

robot coupe®

LARGE RANGE

MP 450 ULTRA

Single phase

100 - 300

Ideal for large restaurants, institutions and caterers

With a maximum batch capacity of 100L, the MP 450 ULTRA can mix, blend and emulsify in no time at all. Its performance in terms of hygiene, ease of use, durability and return on investment makes it the best choice for your kitchen.

REQUEST A DEMONSTRATION

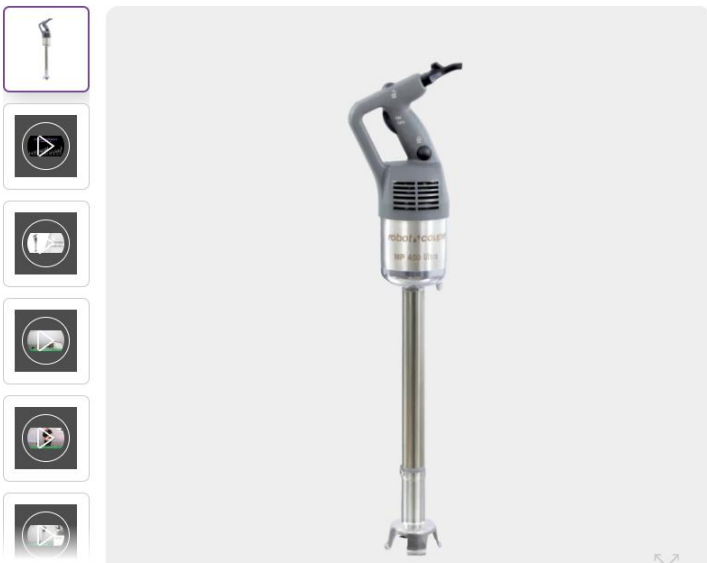


Figure 31. Hand mixer Robot Coupe
Taken from Robot Coupe Ireland, 2023

SkyLine Premium Ovens 10GN 1/1 - electric

SkyLine Premium Electric Combi Oven 10GN1/1

COD 217822

SkyLine Premium Combi Boiler Oven with digital control, 10x1/1GN, electric, programmable, automatic cleaning

COMPARE **WHERE TO BUY**



Figure 32. Oven Electrolux
Taken from Electrolux Professional, 2023



Figure 33. Thermometer Lacor
 Taken from Webmenaje Ireland, 2023

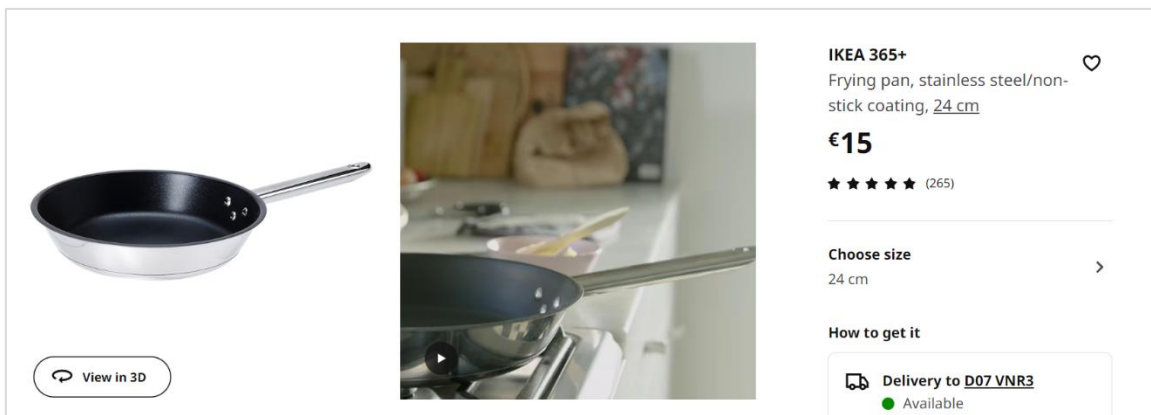


Figure 34. Non-stick pan IKEA
 Taken from IKEA Ireland, 2023

Annex 3

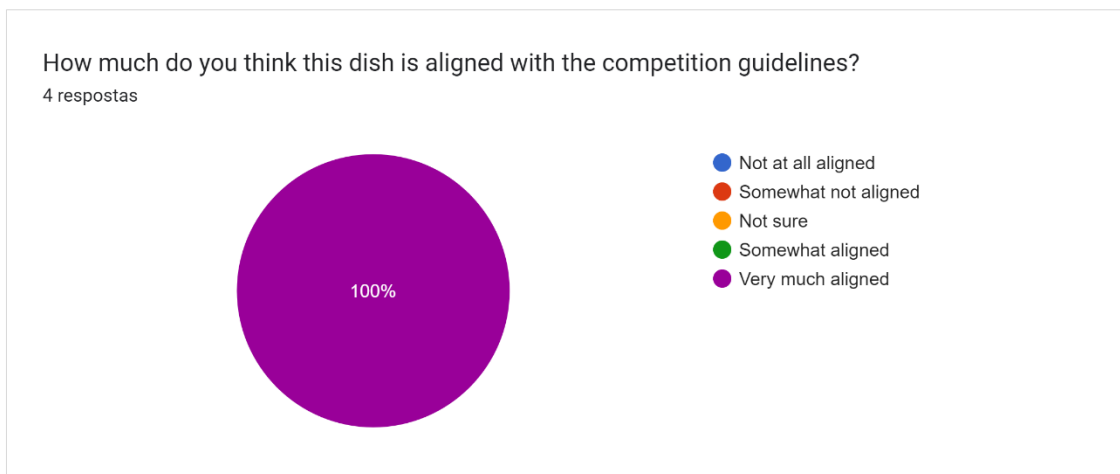


Figure 35. Question on dish alignment

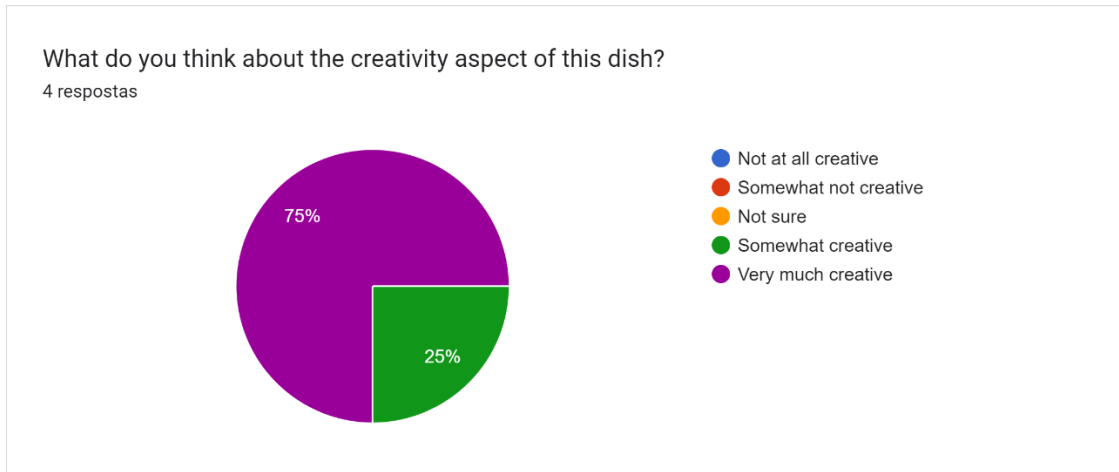


Figure 36. Question on creativity

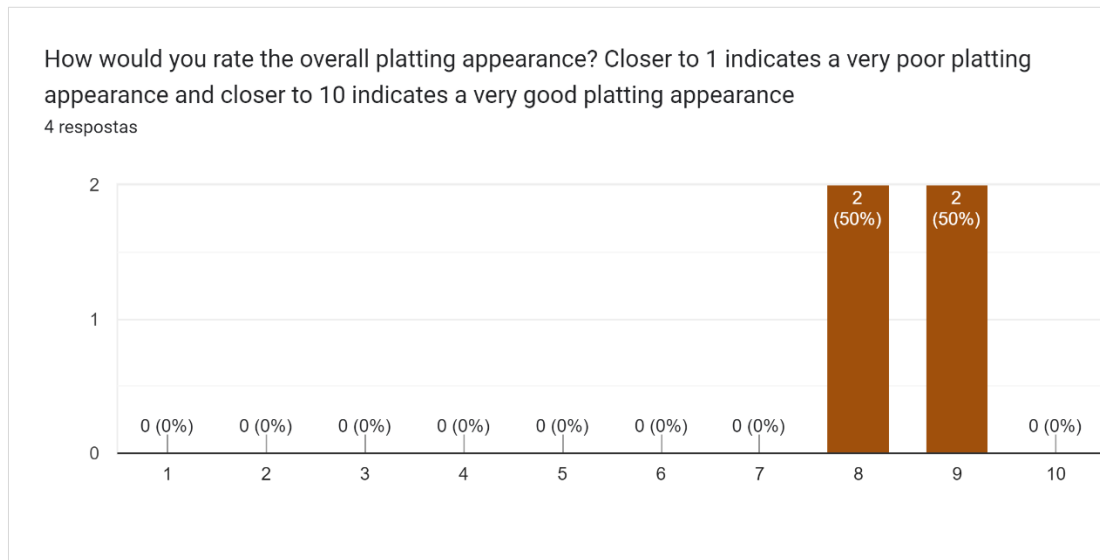


Figure 37. Question on overall plating appearance

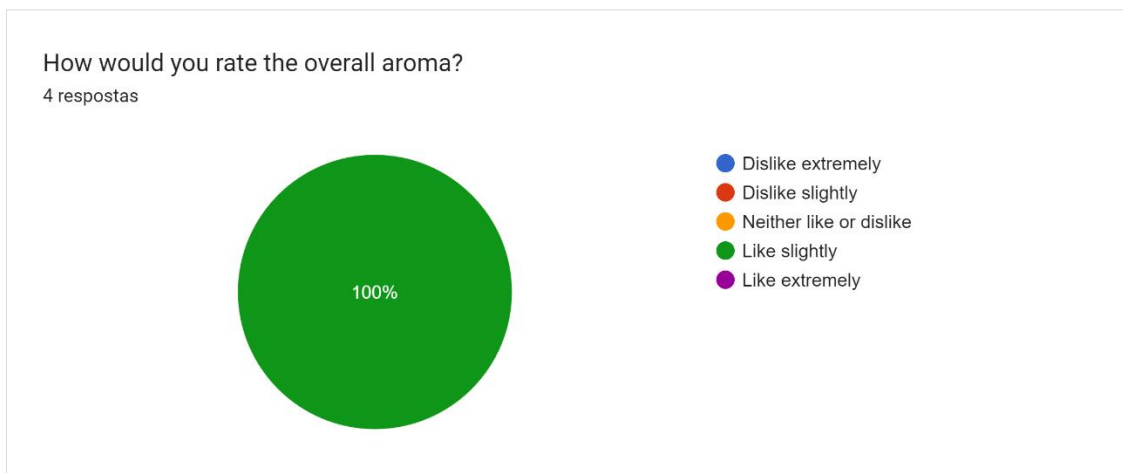


Figure 38. Question on overall aroma

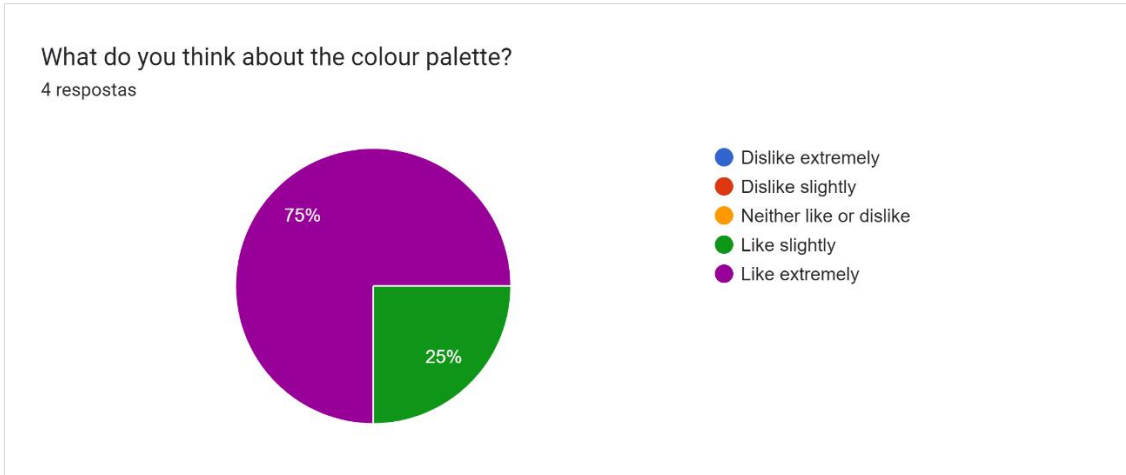


Figure 39. Question on colour palette

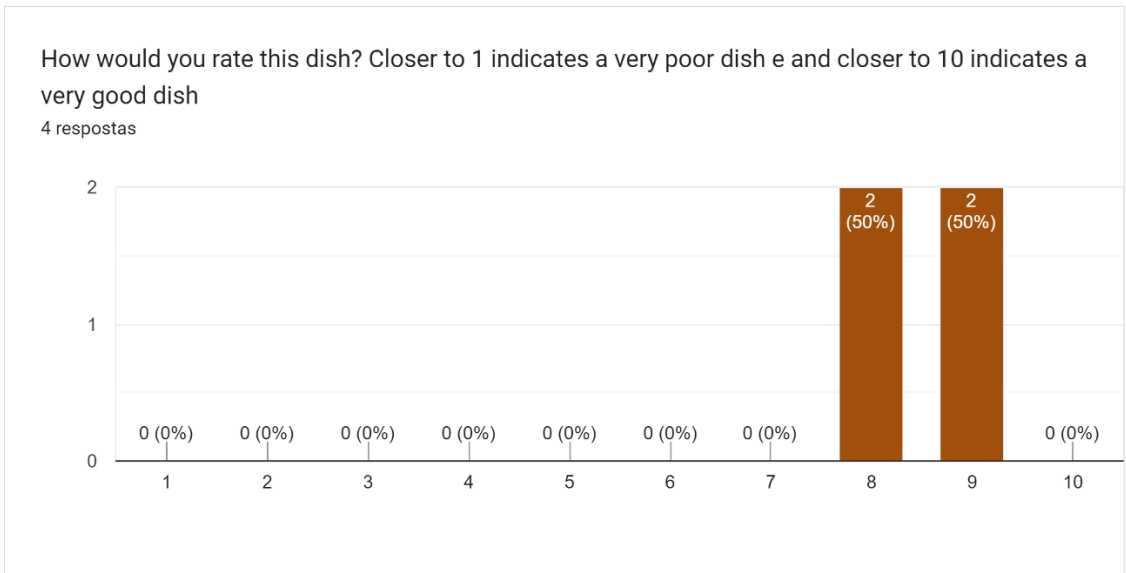


Figure 40. Question on overall rating

LOGBOOKS

Logbook 1

Advanced Molecular Gastronomy (TFCS9025)

Student Name: Natália Câmara

Dish: ‘*Magnificent Roots*’: Reconstructed one-pot soup

20/03/2023

1. Aim

To design a new innovative Note by Note dish made out with pure compounds by using the knowledge acquired from Advanced Molecular Gastronomy classes and from bibliographic research in order to access a Food Waste perspective.

2. Objectives

- To perform the recipe for the first time and adjust it if necessary.
- To assess how all five steps of the recipe will interact together in coherently bring a good flavor to the product.
- To prepare a broccoli tuile and check its details, such as time for preparation and quantities.
- To prepare a gel made from carrots and tomatoes and check its details, such as time for preparation and quantities, and also evaluate agar role in this step.
- To prepare an onion and bacon foam and to ascertain if the use of hyfoamer is necessary.
- To prepare an encapsulated olive oil and check its details, such as time for preparation and quantities.
- To prepare cheese snow and ascertain which type of cheese will be better for the preparation in terms of texture.

3. Materials

3.1. Ingredients

Table 1. List of ingredients for Note by Note dish

Ingredient	Weight
Water	660ml
Vegetable oil	30ml
Plain flour	10g
Green food colouring	0.5g
Carrot powder	45g

Tomato powder	45g
Sparkling sugar	25g
Agar powder	2.5g
Blue cheese powdered	200g
Gouda cheese powdered	200g
Lecithin	4.5g
Onion powder	80g
Smokey bacon flavour	10ml
Cured ham	10ml
Hyfoamer	2g
Purple food colouring	0.5g
Isomalt	200g
Olive oil	5g

3.2. Equipment

- ✓ 4 pots
- ✓ 3 wooden spoons
- ✓ 1 pan
- ✓ 1 bowl
- ✓ 1 silicone mat
- ✓ 1 squeeze bottle
- ✓ 1 metal cutter
- ✓ 1 weighing scale
- ✓ 1 strainer
- ✓ 1 container
- ✓ Stove
- ✓ Hand mixer
- ✓ Thermomixer

4. Methods

4.1. Cauliflower or broccoli tuile

Add 90g of water into a bowl. Add 10g of flour. Add 10g of broccoli powder. Add green food colouring. Whisk until smooth. Add canola oil to a pan and pour a small amount into hot oil. Cook it bubbles subside and appearance is matte. Place tuile on paper towel.

4.2. Carrots and tomatoes fluid gel

Add 300ml of water into a pot. Add 50g of carrot and 50g of tomato powder. Mix it vigorously. Add 100g of sparkling sugar and simmer until soft. Add 2.5g of agar powder and bring to boil for 1-2 minutes. Strain and transfer to a container. Refrigerate it for 1 hour. Use thermomixer on high.

4.3. Cheese snow

Add 200g of water and 200g of blue cheese powder or gouda cheese powder into a pot. Season it with white pepper and garlic powder. Mix it well and slowly bring to boil. Add soy lecithin and cook it for 5 more minutes.

Transfer to a bigger pot and let it cool. Then create bubbles with a hand mixer.

Transfer the bubbles to a container and put it into freezer for 2 hours.

4.4. Onion and bacon foam

Add 100g of water into a pot and bring to boil. Remove the pot from the stove. Add 50g of onion powder, 25g of smokey bacon powder and 25g of cured ham powder. Mix it. Add 15g of hyfoamer. Mix it vigorously. Add the mixture into siphon and pour it into a plate.

4.5. Encapsulated olive oil

Add 200g of isomalt into a pot and add a little bit of water. Cook on medium-low heat until it reaches 165°C. Then, remove it from the heat and set aside to cool down to 140°C.

Place some olive oil into a squeeze bottle and lay out a silicon mat.

Dip a metal cutter into the pan and gently remove it so there is a clear thin layer of the isomalt across. Then, take the squeeze bottle and pour some olive oil into it so the isomalt will encapsulate the olive oil.

5. Results and Discussion

The only two steps possible to be made on this day was the cheese snow and also the onion and smokey bacon foam. In the first case, the recipe was made with a reduction of 50% in order to reduce the freezing time. Two types of powdered cheese were tested – blue cheese and gouda cheese. It took around 1 hour for the cheese to reach a “snowy” frozen texture, but next time the sample should stay in the freezer for a long time. The overall acceptance of the product was not good because of the strong aroma of both gouda and blue cheeses, so parmesan cheese powdered will be used next.

Moreover, the onion and smokey bacon foam had the flavor too strong and the foam did not have a good structure as it was expected, even with the hyfoamer. An orange food colouring was added in order to access the colour of the foam, but there wasn't a lot of difference. Next class, only a smokey

bacon foam will be made with the help of corn flour to give more structure and hyfoamer amount should increase.



Figure 1. Samples of onion and smokey bacon foam. Left: Sample before going through siphon; Right: Sample before going through siphon

6. Conclusions

The results described in this report show that the process used to prepare the recipes of an onion and bacon foam and cheese snow were successfully made. The cheese snow resembled the original recipe with parmesan cheese, but the strong was too powerful, so the goal is to find parmesan cheese to use in the recipe. The onion and bacon foam also had a strong flavor and a structure that was not expected, so it is necessary to add more ingredients in order to achieve the exact structure that is required. Next week, an encapsulated olive oil and a coral tuile will be made along with a tomato fluid gel.

7. Recommendations for next week

- ✓ Make smokey bacon foam instead of onion foam
- ✓ Buy: parmesan cheese powder and carrot powder

Logbook 2

Advanced Molecular Gastronomy (TFCS9025)

Student Name: Natália Câmara

Dish: ‘Magnificent Roots’: Reconstructed one-pot soup

27/03/2023

1. Aim

To design a new innovative Note by Note dish made out with pure compounds by using the knowledge acquired from Advanced Molecular Gastronomy classes and from bibliographic research in order to access a Food Waste perspective.

2. Objectives

- To prepare a broccoli tuile and check its details, such as time for preparation and quantities.
- To prepare a gel made from tomatoes and check its details, such as time for preparation and quantities, and also evaluate agar role in this step.
- To prepare an onion and bacon foam and to ascertain if the use of hyfoamer is necessary.
- To prepare an encapsulated olive oil and check its details, such as time for preparation and quantities.

3. Materials

a. Ingredients

Table 1. List of ingredients for Note by Note dish

Ingredient	Weight
Water	660ml
Sunflower oil	30ml
Cornflour	10g
Celery flavour	0.5ml
Green food colouring	0.5g
Tomato powder	90g
Sparkling sugar	25g
Agar powder	2.5g
Parmesan cheese powdered	200g
Lecithin	4.5g
Cornflour	80g
Smokey bacon flavour	10ml
Cured ham	10ml
Hyfoamer	2g
Purple food colouring	0.5g

Isomalt	200g
Olive oil	5g

b. Equipment

- ✓ 4 pots
- ✓ 3 wooden spoons
- ✓ 1 bowl
- ✓ 1 silicone mat
- ✓ 1 squeeze bottle
- ✓ 1 metal cutter
- ✓ 1 weighing scale
- ✓ 1 strainer
- ✓ 1 container
- ✓ 1 24cm non-stick pan IKEA©
- ✓ 1 kitchen thermometer
- ✓ Stove
- ✓ Hand mixer
- ✓ Thermomixer

4. Methods

a. Tuile

Add 90g of water into a bowl. Add 10g of flour. Add green food colouring. Whisk until smooth. Cover a non-stick pan with canola oil up to 1 or 2mm and heat it up. Pour a small amount of mixture into hot oil. Cook it until bubbles subside and appearance is matte. Place tuile on paper towel.

b. Tomato fluid gel

Add 300ml of water into a pot. Add 100g of tomato powder. Mix it vigorously. Add 25g of sparkling sugar and simmer until soft. Add 2.5g of agar powder and bring to boil for 1-2 minutes. Strain and transfer to a container. Refrigerate it for 1 hour. Use thermomixer on high until smooth. Transfer to a squeeze bottle.

c. Cheese snow

Add 200g of water and 200g of parmesan cheese powder into a pot. Season it with white pepper and garlic powder. Mix it well and slowly bring to boil. Add soy lecithin and cook it for 5 more minutes.

Transfer to a bigger pot and let it cool. Then make bubbles with a hand mixer.

Transfer the bubbles to a container and put it into freezer for 2 hours.

d. Onion and bacon foam

Add 100g of water into a pot and bring to boil. Remove the pot from the stove. Add 50g of onion powder/cornflour, 25g of smokey bacon powder and 25g of cured ham powder. Mix it. Add 15g of hyfoamer. Mix it vigorously. Add the mixture into siphon and pour it into a plate.

e. Encapsulated olive oil

Add 200g of isomalt into a pot and add a little bit of water. Cook on medium-low heat until it reaches 165°C. Then, remove it from the heat and set aside to cool down to 140°C.

Place some olive oil into a squeeze bottle and lay out a silicon mat.

Dip a metal cutter into the pan and gently remove it so there is a clear thin layer of the isomalt across. Then, immediately take the squeeze bottle and pour some olive oil into it so the isomalt will encapsulate the olive oil.

5. Results and Discussion

The tuile was easy accessed. It was tested with yellow and green colourings (Figure 1). The green colouring was better accepted visually, and it will be chosen to the final product. In terms of flavor, the sunflower oil ended up overcoming all the product, so next week a celery flavour will be added in order to better access the flavor and also fit into the concept of this dish.

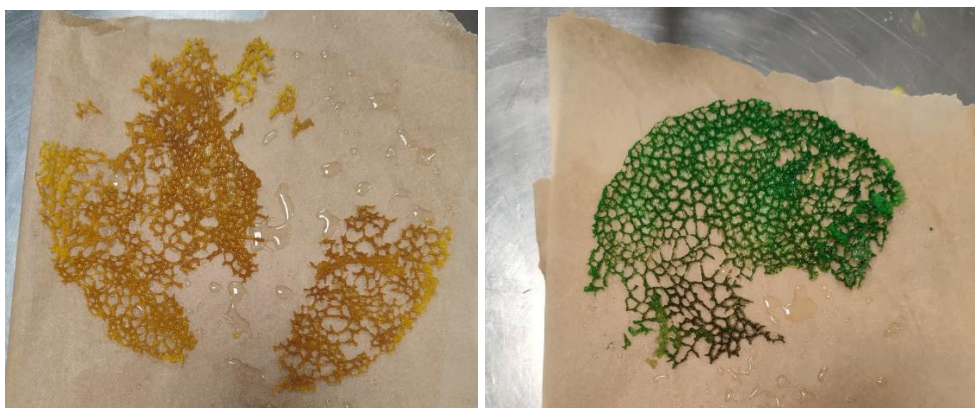


Figure 1. Tuile made with yellow colouring and green colouring

Moreover, an encapsulated olive oil was made (Figure 2). The cooling temperature of the isomalt had to be adjusted from the recipe, but it was successfully made. At the end, isomalt has to cool down to 135°C instead of 140°C otherwise, in this case, it won't be possible to encapsulate the olive oil.



Figure 2. Encapsulated olive oil

Also, the tomato gel was also made (Figure 3), and it assembled a good flavour. However, the texture could be improved, so less tomato powder will be used next week and compared with this week preparation.



Figure 3. Tomato fluid gel

All the components made on 27/03/2023 can be seen below.



Figure 4. Tuile, tomato fluid gel and encapsulated olive oil made on 27/03/2023

Finally, after some reflection, it was decided that more solid components should be added into this dish, so next week carrot peels crisps will be made. It will fit into the Food Waste perspective and also make the dish richer in flavor.

6. Conclusions

The results described in this report show that the process used to prepare the recipes were successfully made. The tuile exactly assembled the original recipe and celery flavour should be added in order to better access the taste. The encapsulated olive oil was well made and follow the original recipe. The tomato fluid gel did not follow the texture expected, but next week two types of gel will differently levels of tomato powder will be compared. Next week, all the steps of the recipe will be accessed.

7. Recommendations for next week

- ✓ Prepare cheese snow and store it
- ✓ Prepare bacon foam
- ✓ Add less tomato into tomato fluid gel
- ✓ Prepare celery tuile

Logbook 3

Advanced Molecular Gastronomy (TFCS9025)

Student Name: Natália Câmara

Dish: ‘Splendour in the Scraps’

17/04/2023

1. Aim

To design a new innovative Note by Note dish made out with pure compounds by using the knowledge acquired from Advanced Molecular Gastronomy classes and from bibliographic research in order to access a Food Waste perspective. The dish is composed of a celery tuile, a tomato gel, an encapsulated olive oil, a parmesan snow, carrot peels crisp, and a vegetable cake.

2. Objectives

- To prepare carrot peel crisps and check its details, such as time for preparation and quantities.
- To prepare parmesan snow, check its details and store in the freezer.
- To prepare two tomato gels with different amount of tomato powder and check its preferable texture.
- To prepare a vegetable cake and check its details.

3. Materials

a. Ingredients

Table 1. List of ingredients for Note by Note dish

Ingredients	Dosage (%)	Weight (g)
Celery tuile		
Water	65	40
Olive oil	24	15
Cornflour	8	5
Green food colouring	1	0.5
Celery flavour	2	1
Total	100	61.5
Tomato fluid gel		
Water	53	60
Tomato powder	35	40
Sparkling sugar	11	12.5
Agar powder	1	1.5
Total	100	114
Cheese snow		

Water	48	100
Parmesan cheese powdered	48	100
Soy lecithin	4	4.5
Total	100	104.5
Encapsulated olive oil		
Isomalt	93	100
Olive oil	5	5
Water	2	2
Total	100	107
Carrot peel crisp		
Carrot peel	83	40
Olive oil	13	6
Salt	2	1
White pepper	2	1
Total	100	48
Vegetable cake		
Carrot powder	28	20
Spinach powder	28	20
Water	21	15
Gluten	21	15
Salt	1	1
Xanthan gum	1	1
Total	100	72

b. Equipment

- ✓ 4 pots
- ✓ 3 wooden spoons
- ✓ 3 bowls
- ✓ 1 silicone mat
- ✓ 1 squeeze bottle
- ✓ 1 peeler
- ✓ 1 metal cutter
- ✓ 1 weighing scale
- ✓ 1 strainer
- ✓ 1 container
- ✓ 1 non-stick pan IKEA© 24cm
- ✓ 1 kitchen thermometer
- ✓ 1 cookie sheet
- ✓ Parchment paper

- ✓ Stove
- ✓ Hand mixer
- ✓ Thermomixer

4. Methods

a. Celery tuile

Add 90g of water into a bowl. Add 10g of cornflour. Add green food colouring. Add celery flavour. Whisk until smooth. Cover a non-stick pan with olive oil up to 1 or 2mm and heat it up. Pour a small amount of mixture into hot oil. Cook it until bubbles subside and appearance is matte. Place tuile on paper towel. Serve.

b. Tomato fluid gel

Add 300ml of water into a pot. Add 100g of tomato powder. Mix it vigorously. Add 25g of sparkling sugar and simmer until soft. Add 3g of agar powder and bring to boil for 1-2 minutes. Strain and transfer to a container. Refrigerate it for 1 hour. Use thermomixer on high until smooth. Transfer to a squeeze bottle and serve.

c. Cheese snow

Add 200g of water and 200g of parmesan cheese powdered into a pot. Season it with 1g of white pepper and 1g of garlic powder. Mix it well and slowly bring to boil. Add soy lecithin and cook it for 5 more minutes. Transfer to a bigger pot and let it cool. Then, make bubbles with a hand mixer. Transfer the bubbles to a container and put it into freezer for 2 hours. Take it out of the fridge and serve.

d. Vegetable cake

In a bowl, mix together 1g of xanthan gum, 1g of salt, 15g of gluten, 20g of carrot powder and 20g of spinach powder. Slowly add 15g of water to the mixture, stirring gently, until the mixture forms a thick batter. Heat a non-stick skillet over medium-high heat. Using a spoon or cookie scoop, scoop the vegetable batter onto the skillet, pressing down gently to form a cake. Cook the cakes for 5-7 minutes on each side, until golden brown and cooked through. Serve.

e. Encapsulated olive oil

Add 200g of isomalt into a pot and add a little bit of water. Cook on medium-low heat until it reaches 165°C. Then, remove it from the heat and set aside to cool down to 140°C.

Place some olive oil into a squeeze bottle and lay out a silicon mat.

Dip a metal cutter into the pan and gently remove it so there is a clear thin layer of the isomalt across. Then, immediately take the squeeze bottle and pour some olive oil into it so the isomalt will encapsulate the olive oil. Serve.

f. Carrots peels crisp

Preheat oven to 160°C. Peel carrots, then slice into 40g of carrot peel strips using the vegetable peeler – the thicker the pieces, the better. Add the carrot strips to a bowl and add 6g of olive oil. Place carrot peelings in a single layer on the parchment paper, and sprinkle with salt. Bake for 15 minutes until crispy, tossing once or twice during cooking. Take it out of the oven and serve.

5. Results and Discussion

The cheese snow underwent a thorough evaluation process, taking approximately 2 hours to achieve the desired "snowy" texture. To preserve its texture for the final plating and sensory analysis in the next class, the product was not removed from the freezer.

Additionally, the tomato gel was prepared with a pleasing flavor and texture, using a combination of 80g of tomato powder for 300g of water in the trials.

While the vegetable cake was a suitable accompaniment to the dish, it did not achieve the desired texture when cooked in a non-stick skillet, requiring a finish in the oven at 200°C for 20 minutes.

Creating the carrot peel crisp was a simple process, taking only 7 minutes in the oven at 160°C.

The celery tuile and encapsulated olive oil were not produced in this class due to their fragility and inability to withstand extended storage time. These items will be created in the final class.

All samples were stored in either the fridge or freezer after each trial to facilitate final plating and sensory analysis in the upcoming week.

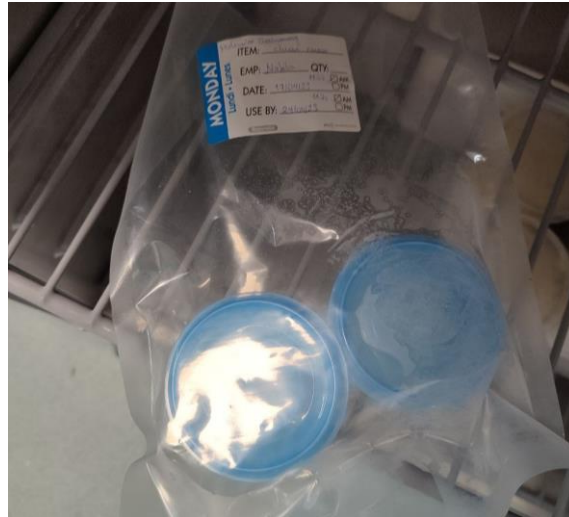


Figure 1. Cheese snow made on 17/04/23

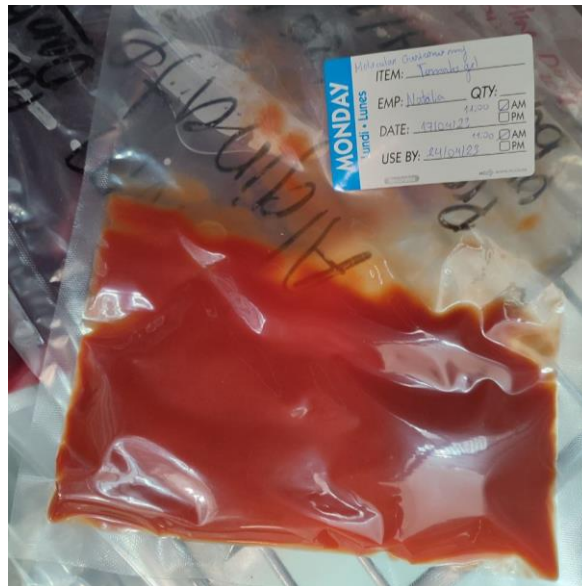


Figure 2. Tomato fluid gel made on 17/04/23

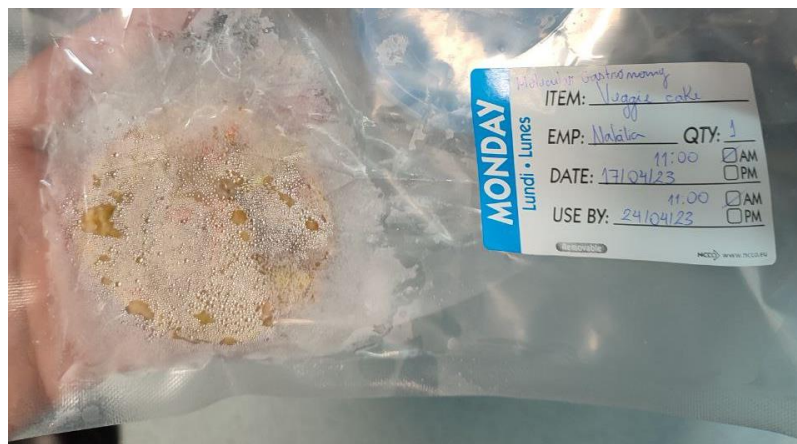


Figure 3. Vegetable cake made on 17/04/23

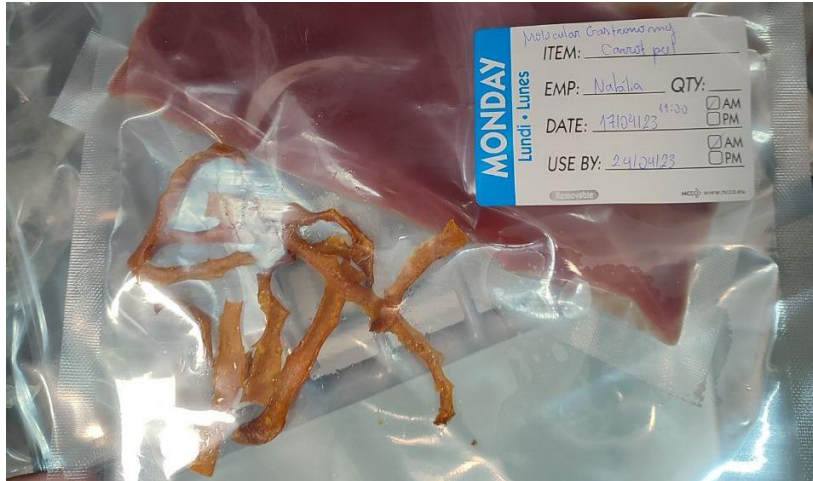


Figure 4. Carrot peels crisp made on 17/04/23

6. Conclusions

The results described in this report show that the process used to prepare the recipes were successfully made. The cheese snow and the tomato fluid gel reached the desired texture. The vegetable cake recipe was changed from stove to oven in order to cook all the product perfectly. The carrot peels crisp were well assessed. Next class, it is necessary to prepare the other 2 components of this dish (encapsulated olive oil and celery tuile) and perform the final plating and sensory analysis.

7. Recommendations for next week

- ✓ Prepare encapsulated olive oil and celery tuile
- ✓ Perform final plating
- ✓ Perform sensory analysis

Logbook 4

Advanced Molecular Gastronomy (TFCS9025)

Student Name: Natália Câmara

Dish: ‘Splendour in the Scraps’

21/04/2023

1. Aim

To design a new innovative Note by Note dish made out with pure compounds by using the knowledge acquired from Advanced Molecular Gastronomy classes and from bibliographic research in order to access a Food Waste perspective. The dish is composed of a celery tuile, a tomato gel, an encapsulated olive oil, a parmesan snow, carrot peels crisp, and a vegetable cake.

2. Objectives

- To prepare encapsulated olive oil and celery tuile as final components of the dish.
- To perform final plating and sensory analysis evaluation.

3. Materials

a. Ingredients

Table 1. List of ingredients for Note by Note dish

Ingredients	Dosage (%)	Weight (g)
Celery tuile		
Water	65	40
Olive oil	24	15
Cornflour	8	5
Green food colouring	1	0.5
Celery flavour	2	1
Total	100	61.5
Tomato fluid gel		
Water	53	60
Tomato powder	35	40
Sparkling sugar	11	12.5
Agar powder	1	1.5
Total	100	114
Cheese snow		
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Encapsulated olive oil		
Isomalt	93	100
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Water	2	2
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White pepper	2	1
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Vegetable cake		
Carrot powder	28	20
Spinach powder	28	20
Water	21	15
Gluten	21	15
Salt	1	1
Xanthan gum	1	1
Total	100	72

b. Equipment

- ✓ 4 pots
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- ✓ 1 strainer
- ✓ 1 container
- ✓ 1 non-stick pan IKEA© 24cm
- ✓ 1 kitchen thermometer
- ✓ 1 cookie sheet
- ✓ Parchment paper
- ✓ Stove
- ✓ Hand mixer
- ✓ Thermomixer

4. Methods

a. Celery tuile

Add 90g of water into a bowl. Add 10g of cornflour. Add green food colouring. Add celery flavour. Whisk until smooth. Cover a non-stick pan with olive oil up to 1 or 2mm and heat it up. Pour a small amount of mixture into hot oil. Cook it until bubbles subside and appearance is matte. Place tuile on paper towel. Serve.

b. Encapsulated olive oil

Add 200g of isomalt into a pot and add a little bit of water. Cook on medium-low heat until it reaches 165°C. Then, remove it from the heat and set aside to cool down to 140°C.

Place some olive oil into a squeeze bottle and lay out a silicon mat.

Dip a metal cutter into the pan and gently remove it so there is a clear thin layer of the isomalt across. Then, immediately take the squeeze bottle and pour some olive oil into it so the isomalt will encapsulate the olive oil. Serve.

c. Sensory analysis

A product assessment was conducted through sensory analysis among the peers of FIPDes Master's program. Prior to their participation in the study, all respondents gave their informed consent. The evaluation of the dish was carried out using a survey distributed via Google Forms. The panellists completed the survey on the researcher's computer, which consisted of six questions regarding the dish's overall aroma, plating appearance, dish rating, color palette, creativity aspect, and similarity to the Note by Note theme.

5. Results and Discussion

The encapsulated olive oil and the celery tuile were greatly assessed. The final plating can be seen below.



Figure 1. Final plating of 'Splendour in the Scraps'

The sensory analysis results and discussion will not be displaced in this logbook but in the final report.

6. Conclusions

According to the findings presented in this report, the recipe preparation process was successful. The entire experiment was a valuable learning experience that involved sharing knowledge and advice during the trials. The dish underwent numerous transformations and, in the end, showcased how commonly discarded ingredients can be repurposed and turned into something splendid.