OLLSCOIL TEICNEOLAÍOCHTA BHAILE ÁTHA CLIATH
TECHNOLOGICAL UNIVERSITY DUBLIN

# NOTE BY NOTE

# ACADEMIC REPORT

Advanced Molecular Gastronomy

**Module Code:** TFCS9025

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# 1. Contenido

## 2. INTRODUCTION

Molecular gastronomy is a discipline that exists at the charming intersection of science and cuisine. It has reshaped our understanding of food preparation and sensory experience, by challenging traditional techniques and offering new possibilities in the kitchen world.

Molecular gastronomy was born in the late 20th century through the groundbreaking work of the scientists Hervé This and Nicholas Kurti. Besides transforming traditional culinary practices, molecular gastronomy seeks to discover and manipulate the physicochemical principles inside the foods we consume (Burke, This and Kelly, 2016). In this framework, Note by Note cuisine took place with a more radical and visionary approach. Note by Note cooking was developed by Hervé This in 1994, with this a new gastronomic language was proposed: dishes made entirely from chemical compounds like amino acids, sugars, acids, and texturizing agents, instead of conventional whole ingredients (Burke and Danaher, 2016).

This project was developed under the theme of *"Food for the Future"*, a topic that calls for a change in how food can be sustainably produced and designed in a world facing challenges of climate change, population growth, and resource scarcity (Abbass et al., 2022). Inside this context, Note by Note cuisine offers a powerful tool by minimizing its dependence on traditional farming, optimizing the nutritional design at molecular level and reducing food waste by using precisely what is needed (Wurgaft, 2015).

For this assignment a specific application of Note by Note principle was required. This project was designed using exclusively dry and powdered forms of pure ingredients, without choosing traditional natural food like eggs, flour, milk, or fruits. By doing this, the dish incorporates the spirit of innovation, while demanding a deep technical understanding of functional ingredients such as maltodextrin, agar-agar, xanthan gum, calcium lactate, and others. During the development of this dish each compound was selected not just for its flavor or appearance, but for its intrinsic physical and chemical properties to obtain the desired results.

However, while a fully synthetic and powder-based dish is pursued, other questions arise. And that is the purpose of this project, to try to answer those questions about whether a Note by Note dish can reach the ingredient functionality, regulatory considerations within the European Union, and innovations in food science that we are aiming for. Here begins the journey.

## 3. AIM OF THE ASSIGNMENT

The goal of this assignment is to design, develop, and critically evaluate a Note by Note dish composed exclusively of dry and powdered pure ingredients. The project aims to apply principles of molecular gastronomy to create an original dish with innovation, precision, and sensory appeal.

The dish should be aligned with the theme of "Food for the Future", looking for exploring the potential of Note by Note cuisine as a sustainable alternative to traditional food systems. It is necessary to select functional compounds depending on the desired outcome while obtaining efficiency with minimal environmental impact.

Following this project's concept, I decided to create a deconstructed landscape, a visual and sensory reflection on the central relationship between nature and nutrition. I chose a landscape to evoke the essential role that natural ecosystems play in life, while at the same time highlighting the challenge that Note by Note cuisine faces: to replicate and eventually accomplish the complex nutritional and sensory needs that nature so effortlessly provides. With this dish, I want to ponder on how food innovation should balance technology while respecting our natural systems.

Additionally, it is required to ensure that all ingredients used comply with the maximum permitted levels established by the European Union for food additives. To finally obtain a conceptual dish where molecules and reactions serve as primary building blocks for a stunning result.

## 4. MATERIALS AND METHODS

Materials

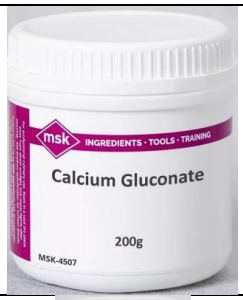
- **Ingredients**
  - *Lake (Blue gel veil)*
    - 100 g water
    - 5–10 drops blueberry flavor
    - 2 g agar-agar
    - 2 sheets of gelatin
    - 5 g sugar
    - Blue food coloring

- *Sun (Spherical passion fruit gel)*
  - 180 g water
  - 4–6 drops passion fruit flavor
  - 5 g sugar
  - 3 g calcium gluconate
  - 0.5 g xanthan gum
  - Yellow food coloring
  - 500 g distilled water
  - 2.5 g sodium alginate
- *Clouds (Siphon Foam)*
  - 125 g water
  - 1–3 drops vanilla extract
  - 5 g sugar
  - 0.1 g xanthan gum
  - 12.5 g MSK Ultrawhip
- *Rocky Formations (Mango Spheres)*
  - 250 g water
  - 5–10 drops mango flavor
  - Black food coloring
  - 2.5 g calcium gluconate
  - 0.5 g xanthan gum
  - 2 g sugar
  - Previous alginate bath
- *Soil (Peta Crispy Chocolate)*
  - 15 g peta crispy chocolate

❖ **Table of Ingredients**

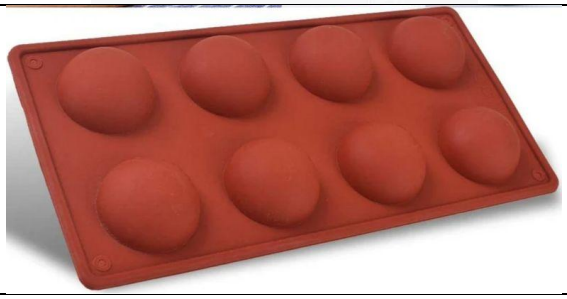
| Ingredient | Image |
|---|---|
| Blueberry flavor |   |

| | |
|---|---|
| Passion fruit flavor |  |
| Mango flavor |  |
| Vanilla extract |  |
| Agar-agar |  |
| Gelatin |  |
| Xanthan gum |  |

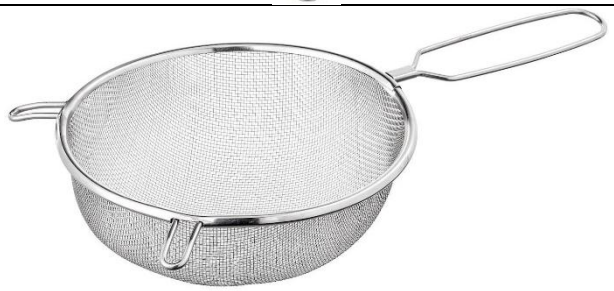
| | |
|---|---|
| Calcium gluconate |  |
| Sodium alginate |  |
| Msk ultrawhip |  |
| Peta crispy chocolate |  |
| Blue food coloring |  |

| | |
|---|---|
| Yellow food coloring |  |
| Black food coloring |  |
| Sugar |  |

## ❖ Table of equipment

| Equipment | Image |
|---|---|
| Digital balance |  |
| Half-sphere Silicone molds |  |

| | |
|---|---|
| Siphon and $N_2O$ cartridges |  |
| Measuring spoons |  |
| Immersion blender |  |
| Small saucepan |  |
| Mixing bowls |  |
| Whisks |  |

| | |
|---|---|
| Silicone spatulas |  |
| Slotted spoon |  |
| Strainer |  |
| Blast freezer |  |
| Refrigerator |  |

Methods

- **Lake (Blue gel veil)**

1. Soak two sheets of gelatin in cold water for 5–10 minutes to bloom.

2. In a saucepan, combine 100 g water with 2 g agar-agar. Let hydrate for 2–3 minutes.
3. Heat the mixture while stirring and bring to a simmer (~85°C) to fully dissolve the agar. Add 5 g sugar.
4. Cool the solution.
5. Squeeze excess water from the bloomed gelatin and incorporate it into the mixture until fully dissolved.
6. Add 5–10 drops of blueberry flavor and a small amount of blue food coloring.
7. Pour onto a circular shape dish, forming a thin layer, and allow to set in a refrigerator.

❖ **Sun (Spherical passion fruit gel)**

Core:

1. Dissolve 5 g sugar and 3 g calcium lactate into 180 g water.
2. Blend in 0.5 g xanthan gum until slightly thickened.
3. Add yellow food coloring and passion fruit flavor.
4. Remove air bubbles by resting the solution or with help of the vacuum sealer, then pour into half-sphere silicone molds and freeze until solid.

Alginate Bath Preparation:

1. Blend 2.5 g sodium alginate into 500 g distilled water using an immersion blender.
2. Allow to rest or use the vacuum sealer to remove air bubbles.

Spherification:

1. Carefully unmold the frozen cores and immerse them into the alginate bath.
2. Let them set for 2–3 minutes.
3. Remove using a slotted spoon and rinse in clean water.

❖ **Clouds (Siphon Foam)**

1. Combine 125 g water, 5 g sugar, 0.1 g xanthan gum, and 1–3 drops of vanilla extract in a bowl.
2. Add 12.5 g MSK Ultrawhip and blend using an immersion blender until fully homogeneous.
3. Strain the mixture to eliminate any lumps.
4. Transfer the mixture to a siphon, charge with one $N_2O$ cartridge, and shake vigorously (~15 times).

5. Pipe the foam onto the dish in soft, cloud-like forms.

❖ **Rocky Formations (Mango Spheres)**

Mango Base Preparation

1. Dissolve 2.5 g calcium lactate gluconate and 2 g sugar into 250 g water.
2. Blend in 0.5 g xanthan gum for slight thickening.
3. Add mango flavor and allow the mixture to rest to eliminate air bubbles or use the vacuum sealer.

Spherification

1. Drop spoonfuls of the mango base gently into the alginate bath (previous prepared).
2. Allow spheres to form for 2–3 minutes.
3. Retrieve spheres with a slotted spoon and rinse.

❖ **Soil (Peta Crispy Chocolate)**

1. Grind 15g of peta crispy chocolate in a mortar.

❖ **Assembly of the Deconstructed Landscape**

1. Spread the glossy blue gel (Lake) as the base of the dish.
2. Arrange the spherical Sun over the lake.
3. Sprinkle the grounded Peta Crispy Chocolate (Soil) around the lake to add texture.
4. Arrange the spherical Mango Rocky Formations over the soil and around the lake.
5. Pipe the vanilla-flavored Clouds using the siphon around the lake and between the mango stones.

## 5. RESULTS

The final dish called “Deconstructed Molecular Landscape”, accomplished the project’s conceptual and technical objectives. This dish is composed of five distinct components:

- The blue gel veil “lake”.
- The yellow sphere “sun”.
- The siphon foamy “clouds”.
- The black spheres “rocks”.
- The grounded peta crispy chocolate “soil”.

The plating was set to show a minimalist and different natural scene, with the elements harmoniously arranged to create visual balance and thematic unity. The lake formed a serene translucent base, where the sun can be set at the center with its brilliant color and smooth spherical shape bringing attention to it. To complete the dish with soil and stones around it, to finally add a special touch with the clouds that added volume and lightness, resting around the sun.

**Image 1.** Final dish under controlled studio lighting

**Image 2.** Close-up view in the kitchen setting

❖ **Sensory Analysis**

To evaluate the sensory qualities of the dish, a structured sensory survey was designed, targeting the following attributes:

- Visual Appeal
- Flavor Intensity
- Texture Complexity
- Balance of Flavors
- Originality and Creativity
- Overall Enjoyment

This survey was conducted among 8 tasters, to rate the dish on a scale from 1 to 5, where 1 = very poor and 5 = excellent. Also, at the end of the survey, open comments were collected for qualitative feedback. Obtaining the following results:

*Table of Sensory Analysis Results*

| **Attribute** | **Average Score** |
|---|---|
| Visual Appeal | 4.8 |
| Flavor Intensity | 4.2 |
| Texture Complexity | 4.5 |
| Balance of Flavors | 4.0 |
| Originality and Creativity | 4.9 |
| Overall Enjoyment | 4.6 |

Finally, the qualitative feedback collected from various tasters revealed two main groups of opinions:

- Positive comments: Great visual presentation, variety of textures, nice contrast between textures.
- Recommendations: The flavor balance can be improved, too sweet for some tasters, can have more acidity.

## 6. DISCUSSION

The final dish called "Deconstructed Molecular Landscape" achieved the main goal of wrap all the conceptual vision of this project. It is able to show a technically sophisticated dish reflecting the role of nature in human nutrition. At the same time, it goes through the border of Note by Note cuisine for a "Food for the Future" concept.

Visual and Structural Evaluation

To accomplish this dish with different but harmonized forms, textures and colors, it required a variety of molecular gastronomy techniques. The smooth surface of the "lake" shows the proper hydration and dissolution of agar-agar, a polysaccharide that forms gels once cooling without the need of any particular ions to gel (This, 2009; CyberColloids, n.d.). This combined with gelatin, a protein-based gelling agent, provided elasticity and resilience to prevent any crackle (Rather et al., 2022).

The "sun" as well as the "rocks" achieved a perfect spherical geometry through reverse spherification, by taking advantage of the gelling interaction between sodium alginate and calcium ions (Luo et al., 2016). Freezing the cores of the "sun" before soaking them in the alginate solution helped to maintain the perfect spherical shape without wasting time. While the spoon technique was more than enough for the "rocks".

The "clouds" were produced through a siphon foam technique, using xanthan gum and MSK Ultrawhip. This method involves infusing liquid $N_2O$ into the foam precursor, which is then dispensed through a nozzle. Upon release, the expansion of $N_2O$ creates a wet foam structure. $N_2O$ is particularly effective for this process, as it dissolves readily in both hydrophilic and hydrophobic substances, ensuring a stable and airy foam texture (Nypelö et al., 2021).

Sensory Analysis Interpretation

A score of 4.8/5 for visual appeal and 4.9/5 for originality confirms that the landscape image was effectively taken by the tasters, engaging both emotional and sensory perception. While a score of 4.5/5 for the texture complexity shows the successful interaction of multiple mouthfeel textures. However, the slightly lower scores in flavor balance (4.0/5) revealed a limitation in flavor. Despite using multiple fruity flavors such as: blueberry, passion fruit and mango; the dish leaned into sweet notes, lacking contrasting elements such as bitterness or acidity, which are essential to create full flavor complement.

Technical Evaluation

Different technical skills were used along with this dish:

- Correct hydrocolloid behavior, achieving stable gels with minimal syneresis (Alam, Dar and Nanda, 2024).

- Ion-controlled gelation for successful spherification (Bennacef et al., 2021).
- The main techniques used were reverse spherification, gelation and foaming to obtain all different textures present in the dish.

However, some imperfections during the foaming process were perceived. These issues can be handled by optimizing the use of the siphon, specifically by adjusting factors as the number of shakes or proper cooling temperature before piping the foam.

Beyond that, the technical level achieved in the dish was fully acceptable and even better than expected.

Reflection on Concept and Broader Implications

The message of the Deconstructed Landscape goes beyond the aesthetic and technical exercise of this assignment, it is a critical comment on the future of food. As society keeps expanding and evolving, the environmental conditions keep getting worse and alternatives as Note by Note cuisine offer a possible solution to optimize resources, reduce agricultural dependence and, even, reach personalized nutrition (This, 2019).

However, what the concept of the dish tries to reflect the philosophical and nutritional challenges that purely synthetic food systems face. Nature not only feeds us but also inspires us and connects with us, something that synthetic food design struggles to accomplish.

Thus, while Note by Note techniques can replicate certain sensory experiences, achieving full nutritional and cultural equivalence to traditional foods will require further scientific advances and interdisciplinary innovation.

## 7. CONCLUSIONS

The project successfully achieved its objective of creating a fully Note by Note dish using only pure powdered and dry ingredients. The final Deconstructed Molecular Landscape demonstrated a high level of technical precision, creativity, and conceptual depth.

From a technical point of view, the dish shows the effective application of molecular gastronomy techniques such as gelification, spherification, foam generation, and texture contrast through specialized ingredients. Resulting in a well-accepted dish, reflected in a sensory analysis with promising results that

conclude that the dish has a good visual appeal, texture complexity, creativity, and overall acceptance.

This project helped to understand the importance of keep approaching food innovations from a scientific perspective, while respecting and considering the complexity of nature. This assignment was effectively completed and contributed to a better understanding of the potential of Note by Note cuisine as a sustainable gastronomy.

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# 9. LOGBOOKS

Logbook 1

**MODULE CODE: TFCS9025**

**MODULE TITLE: Advanced Molecular Gastronomy**

**STUDENT NAME:** Cynthia Soto Villegas

**FOOD PRODUCT:** Molecular landscape.

**WEEK NO.:** 1 **DATE:** March 17th, 2025.

**Weekly Aims and Objectives**

**Aim:** To practice and refine key molecular gastronomy techniques required to build my landscape dish, focusing on texture control, stability, and visual presentation within the given time constraints.

**Objectives:**

- Be able to do spherification to create stable, uniform sugar-based spheres for the sun.
- Create a fluid gel using agar-agar with a smooth, glossy finish for the lake.
- Ensure the siphon cake has a uniform porous structure and doesn't collapse after microwaving.
- Achieve a consistent foam texture for the maltodextrin clouds and chocolate air mousse.

**Materials and Method (Ingredients, Equipment and Method)**

**Ingredients:**

1. **The Lake (Glossy Blue Gel)**

200 ml water + sandia flavor
3 g agar-agar
5 g glycerol (for shine)
1 g blue colorant
5 g sugar

2. **The Mountains (Microwave Sponge Cake)**

60g Egg white powder
120g Water

30g Skim Milk Powder
40g Maltodextrin
30g Cocoa Butter
10g Cocoa Powder
5g Instant Coffee Powder (optional)
3g Baking Powder
10g Cornstarch
Pinch of Salt
20g sugar

**3. The Sun (Spherical Sugar Gel)**

100 ml sugar syrup (50% sugar, 50% water)
2 g sodium alginate
200 ml calcium chloride solution (1% concentration)
Yellow food coloring
1 g citric acid

**4. The Clouds (Maltodextrin Foam)**

50 g maltodextrin
20 g coconut oil
5 ml vanilla extract

**5. The Soil (Caramelized Maltodextrin and Cocoa Crumble)**

50 g sugar
20 g maltodextrin
10 g cocoa powder
5 g butter (optional, for richness)

**6. The Rocky Formations (Textured Sugar and Cocoa Clusters)**

30 g caramelized sugar granules
10 g cocoa powder
5 g maltodextrin

**Method:**

**1. The Lake (Glossy Blue Gel)**

1. Heat flavored water in a saucepan to 85°C.
2. Whisk in agar-agar and sugar until fully dissolved.
3. Stir in glycerol for shine.

4. Pour into a flat mold and let it set in the fridge (about 15 minutes).
5. Once set, blend gently with an immersion blender for a smooth gel.
6. Pour onto the plate in the desired lake shape.

**2. The Mountains (Aerated Chocolate & Structured Gel)**

**Aerated Chocolate:**

1. Hydrate the egg white powder by whisking 60g egg white powder with 120g water until foamy.
2. Melt the cocoa butter and let it cool slightly.
3. Mix the dry ingredients:
4. In a bowl, whisk together skim milk powder, maltodextrin, cocoa powder, coffee powder (if using), baking powder, cornstarch, and salt.
5. Combine everything.
6. Slowly add the dry mix into the egg white mixture while whisking.
7. Fold in the melted cocoa butter and mix gently.
8. Pour the mixture into a cream siphon and charge it with one N2O cartridge.
9. Shake vigorously for 10-15 seconds to incorporate air.
10. Let the siphon rest for 5 minutes for better aeration.
11. Spray a disposable cup or microwave-safe mold with oil.
12. Dispense the aerated batter into the cup, filling only one-third (it will expand).
13. Microwave at 800W for 40-50 seconds until the cake puffs up and sets.
14. Let the cakes cool upside down to prevent collapsing.
15. Remove from the cup and tear into rough mountain shapes.
16. Store in an airtight container to prevent drying out.

**3. The Sun (Spherical Sugar Gel)**

1. Blend **sodium alginate** into **sugar syrup** and let it rest for **30 minutes**.
2. In another bowl, prepare a **calcium chloride bath** (200 ml water + 2 g calcium chloride).
3. Use a spoon to drop small amounts of the alginate mixture into the bath.
4. Let sit for **1 minute**, then remove with a slotted spoon.
5. Rinse in water and set aside.

**4. The Clouds (Maltodextrin Foam)**

**Maltodextrin Foam:**

1. Blend **maltodextrin** with **coconut oil** until it forms a **light, fluffy powder**.

**5. The Soil (Cocoa & Maltodextrin Crumble)**

1. Caramelize **sugar** in a pan until golden brown.
2. Let cool and crush into **small granules**.
3. Mix with **maltodextrin** and **cocoa powder**.

**6. The Rocky Formations (Textured Sugar and Cocoa Clusters)**

1. Mix **caramelized sugar granules, cocoa powder, and maltodextrin**.
2. Shape into small **clusters**.

## Results and discussion

The sun:

Before starting, I decided to use reverse spherification instead of the basic method because of its characteristics. Reverse spherification helps to make spheres with thicker membranes able to last longer and hold together even for larger spheres (Revilla, 2022). However, while I was preparing the passion fruit juice to mix with calcium chloride, I realized that it was too liquid, making it difficult the spherification inside the alginate bath. To fix that, I added 0.5g of guar gum, which thickened the juice just enough to enable spherification. While this improved the process, the resulting spheres were not as large or round as I had hoped. For the next class, I plan to use a silicone mold to improve their shape and size.

The lake:

The procedure was quite straightforward, but I overestimated the importance of heating the solution to properly dissolve agar-agar, which is essential to activate its gelling properties (Lange, 2021). For that reason, my lake did not gel within the expected time. I'm working on that for next week.

## Conclusions

Spherification is difficult to handle but practice can help a lot, particularly if the mixture is thick enough. Also, the time management was a huge problem in this session because I didn't have enough time to try every element of the dish.

**Recommendations for the following week**

- I need to organize my time better, so I'll be able to do everything.
- Try the sun shape with a silicon mold.
- Heat the agar-agar solution so it can work for gelling.

Logbook 2

**MODULE CODE: TFCS9025**

**MODULE TITLE: Advanced Molecular Gastronomy**

**STUDENT NAME:** Cynthia Soto Villegas

**FOOD PRODUCT:** Molecular landscape.

**WEEK NO.:** 2 **DATE:** March 24th, 2025.

**Weekly Aims and Objectives**

**Aim:** Make sure to test each component of the dish at least once.

**Objectives:**

- Make a suitable sphere for the sun through reverse spherification with better shape and larger.
- Make a sponge cake for the mountains.
- Improve time management to accomplish every element.

**Materials and Method (Ingredients, Equipment and Method)**

**Ingredients:**

1. **The Lake (Glossy Blue Gel)**

100g water
5g blueberry powder
2g agar-agar
2 sheets of gelatin (gold strength, bloomed in cold water)
5g sugar
1g citric acid
1 drop glycerin

2. **The Mountains (Microwave Sponge Cake)**

30g Egg white powder
60g Water

15g Skim Milk Powder
20g Maltodextrin
15g Cocoa Butter
5g Cocoa Powder
1.5g Baking Powder
5g Cornstarch
Pinch of Salt
10g sugar

**3. The Sun (Spherical Sugar Gel)**

180g water
10g passion fruit powder
5g sugar
3g calcium lactate
1.5g xanthan gum
Yellow & orange food coloring
A pinch of citric acid for a tangy kick

<u>For the Alginate Bath</u>

500g of distilled water
2.5g sodium alginate

**4. The Clouds (Vanilla air)**

100ml water
2g soy lecithin
3g vanilla extract
1g sugar

**5. The Rocky Formations (Mango spheres)**

<u>For the Mango Base (to encapsulate):</u>

250g water
20g mango powder
2.5g calcium lactate gluconate
1g xanthan gum
2g sugar

<u>For the Alginate Bath:</u>

500g deionized water

2.5g sodium alginate

For the Shell Coating:

100g cocoa butter

**Method:**

**1. The Lake (Glossy Blue Gel)**

- Soak the 2 gelatin sheets in cold water for 5–10 minutes. Set aside.
- In a saucepan, whisk together 200g water, 5g blueberry powder, 2g agar-agar. Let sit for 2–3 minutes to hydrate the agar.
- Slowly heat while stirring. Bring to a simmer (~85°C). Agar must fully dissolve. Add sugar.
- Remove from heat and cool to around 60°C.
  Squeeze out the bloomed gelatin sheets and stir them in until they are fullydissolved.
- Stir in 1g citric acid. Add 1 drop glycerin.
- Pour onto a silicone mat, acetate sheet, or into a mold in a thin layer. Let it cool at room temp until set (20–30 min), or refrigerate for a faster set.

**2. The Mountains (Sponge cake)**

Prepare the Batter

- Hydrate the egg white powder by whisking 30g egg white powder with 60g water until foamy.
- Melt the 15g cocoa butter and let it cool slightly.
- Mix the dry ingredients in a bowl, whisk together 15g skim milk powder, 20g maltodextrin, 5g cocoa powder, 1.5g baking powder, 5g cornstarch, and salt.
- Combine everything slowly and add the dry mix into the egg white mixture while whisking.
- Fold in the melted cocoa butter and mix gently.

Aerate the Batter with the Siphon

- Pour the mixture into a cream siphon and charge it with one N2O cartridge.
- Shake vigorously for 10-15 seconds to incorporate air.
- Let the siphon rest for 5 minutes for better aeration.

Cook the Cake (Microwave Method)

- Spray a disposable cup or microwave-safe mold with oil.
- Dispense the aerated batter into the cup, filling only one-third (it will expand).
- Microwave at 800W for 40-50 seconds until the cake puffs up and sets.

Shape the Mountains

- Let the cakes cool upside down to prevent collapsing.
- Remove from the cup and tear into rough mountain shapes.
- Store in an airtight container to prevent drying out.
- Dust with cocoa powder or maltodextrin for a rugged, dry look.
- Use powdered milk or coconut powder for snowy peaks.
- Drizzle with melted cocoa butter for texture contrast.
- Arrange pieces to resemble mountain formations.

**3. The Sun (Spherical Sugar Gel)**

Prepare the Liquid Core (for Mold)

- Blend passion fruit powder (10g), sugar (5g), and calcium lactate (3g) into water (180g).
- Add xanthan gum (1.5g) and blend until slightly thickened.
- Add food coloring for a bright sun-like appearance.
- Let the mixture rest for 1 hour (or vacuum-seal to remove air bubbles).
- Pour into half-sphere silicone molds and freeze until solid (1–2 hours).

Prepare the Sodium Alginate Bath

- Blend sodium alginate (2,5g) into distilled water (500g).
- Let sit for 12+ hours to remove air bubbles (ensures smooth gelation).

Spherification Using the Molded Core

- Unmold frozen calcium cores (they should hold their shape).
- Drop directly into the sodium alginate bath.
- Let them set for 2–3 minutes (longer if you want a thicker membrane).
- Remove carefully with a slotted spoon and rinse in clean water.

**4. The Clouds (Vanilla air)**

- If using vanilla extract, mix it directly into room-temperature water.
- Stir in 1g sugar/stevia (optional) to balance flavors.

- Sprinkle 2g soy lecithin evenly over the liquid.
- Let it hydrate for 2-3 minutes so it dissolves fully.
- Use an immersion blender at an angle (about 45°) just above the surface.
- Blend on high for 2-3 minutes until you see stable bubbles forming on top.
- If the foam is too thin, let it rest for 30 seconds before blending again.
- Use a spoon or fine strainer to carefully scoop the foam from the top.

**5. The Rocky Formations (Mango spheres)**

Prepare the Mango Base

- Mix 250g of water with mango powder until smooth (adjust powder to taste intensity).
- Add 2.5g calcium lactate gluconate and dissolve completely.
- Blend in 1g xanthan gum if you want a slightly thicker texture.
- Let it rest for 15–30 minutes to remove air bubbles.

Prepare the Alginate Bath

- Blend 2.5g sodium alginate into 500g deionized water using an immersion blender.
- Let it rest for 1–2 hours (or vacuum degas) to eliminate bubbles for a smooth bath.

Form the Spheres

- Using a spoon, gently drop the mango base into the alginate bath.
- Let them sit for 2–3 minutes.
- Remove carefully with a slotted spoon and rinse in clean water.
- Put on the freezer to preserve before coating.

Coat with Cocoa Butter Shell

- Gently melt 100g cocoa butter at 40–45°C.
- Mix in charcoal to achieve your desired stone color.
- Place the frozen mango spheres on a fork and dip quickly into the melted cocoa butter, then place on a cold plate or silicone mat.

**Results and discussion**

Today's kitchen session was really interesting, I had better management of my time, so I was able to do each element of my dish. However, along the way, I observed several things to improve.

First, powder flavors are very difficult to solve in water and the color that gives to the solution is not as appealing as I would like. In this case, I think that the better option is to work with flavor drops instead of powder, not just for how easy it is to mix them but also because it gives me freedom to work with colors. But I must take some considerations as adding at the end so any type of cooking technique will not affect them.

In the case of the sponge cake I had several inconveniences, first, the flavor was too salty for what I'm looking for, so, I need to work in the flavor. Also, the texture required more water because originally it was too thick to pour it in the siphon. Then, it is necessary to reformulate how I'm doing the siphon cake.

Finally, the spherification process improved a lot in this session. However, for the sun I need a bigger sphere, and I tried to use a silicon mold to gel it before soaking it in the alginate bath. The big problem was that I used the fridge, and it didn't have enough time to gel, in that case I am thinking about using blast freezer to check if that is viable.

**Conclusion**

This session improved a lot from the last one, but time management is still something to work on because I don't have enough time to decorate the dish. Besides that, the siphon cake needs more work to improve its appearance. I want to try flavor drops to see if it's easier and faster to work with and reformulate some elements to reach the texture and flavor that I am expecting.

**Recommendations for the following week**

- Use blast freezer to fasten up the sun sphere.
- Work on the siphon cake texture and flavor.
- Use flavor drops instead of powder.
- Check the time to leave enough at the end for plating.

**STUDENT NAME:** Cynthia Soto Villegas

**FOOD PRODUCT:** Molecular landscape.

**WEEK NO.:** 3 **DATE:** March 31st, 2025.

**Weekly Aims and Objectives**

**Aim:** Finish the dish at least once.

**Objectives:**

- Use the blast freezer for the sun sphere.
- Thinner siphon cake.
- Work with drops instead of powder flavors.
- Keep working on time management.

**Materials and Method (Ingredients, Equipment and Method)**

**Ingredients:**

1. **The Lake (Glossy Blue Gel)**

100g water
5 – 10 g blueberry flavor drops.
2g agar-agar
2 sheets of gelatin (gold strength, bloomed in cold water)
10g sugar
1g citric acid
Blue food coloring
1 drop glycerin

2. **The Mountains (Microwave Sponge Cake)**

25g Egg white powder
75g Water
12g Skim Milk Powder
15g Maltodextrin
12g Cocoa Butter
10g Cocoa Powder
1g Baking Powder
4g Cornstarch
Pinch of Salt
Vanilla flavor

20g sugar

**3. The Sun (Spherical Sugar Gel)**

180g water
4 – 6 drops passion fruit flavor
5g sugar
3g calcium lactate
1.5g xanthan gum
Yellow & orange food coloring
A pinch of citric acid for a tangy kick

For the Alginate Bath

500g of distilled water
2.5g sodium alginate

**4. The Clouds (Vanilla air)**

100ml water
2g soy lecithin
3g vanilla extract
1g sugar

**5. The Rocky Formations (Mango spheres)**

For the Mango Base (to encapsulate):

250g water
5 – 10 drops mango flavor
2.5g calcium lactate gluconate
1g xanthan gum
2g sugar

For the Alginate Bath:

500g deionized water
2.5g sodium alginate

For the Shell Coating:

100g cocoa butter

**Method:**

**1. The Lake (Glossy Blue Gel)**

- Soak the 2 gelatin sheets in cold water for 5–10 minutes. Set aside.
- In a saucepan, whisk together 200g water and 2g agar-agar. Let sit for 2–3 minutes to hydrate the agar.
- Slowly heat while stirring. Bring to a simmer (~85°C). Agar must fully dissolve. Add sugar.
- Remove from heat and cool to around 60°C.
  Squeeze out the bloomed gelatin sheets and stir them in until they are fully dissolved.
- Stir in 5 -10 drops of blueberry flavor and 1g citric acid. Add 1 drop glycerin.
  Pour onto a silicone mat, acetate sheet, or into a mold in a thin layer. Let it cool at room temp until set (20–30 min) or refrigerate for a faster set.

**2. The Mountains (Sponge cake)**

Prepare the Batter

- Hydrate the egg white powder by whisking 25g egg white powder with 75g water until foamy.
- Melt the 12g cocoa butter and let it cool slightly.
- Mix the dry ingredients in a bowl, whisk together 12g skim milk powder, 15g maltodextrin, 10g cocoa powder, 1g baking powder, 4g cornstarch, 20g sugar and salt.
- Combine everything slowly and add the dry mix into the egg white mixture while whisking.
- Fold in the melted cocoa butter and vanilla flavor and mix gently.

Aerate the Batter with the Siphon

- Pour the mixture into a cream siphon and charge it with one N2O cartridge.
- Shake vigorously for 10-15 seconds to incorporate air.
- Let the siphon rest for 5 minutes for better aeration.

Cook the Cake (Microwave Method)

- Spray a disposable cup or microwave-safe mold with oil.

- Dispense the aerated batter into the cup, filling only one-third (it will expand).
- Microwave at 800W for 40-50 seconds until the cake puffs up and sets.

Shape the Mountains

- Let the cakes cool upside down to prevent collapsing.
- Remove from the cup and tear into rough mountain shapes.

**3. The Sun (Spherical Sugar Gel)**

Prepare the Liquid Core (for Mold)

- Blend sugar (5g) and calcium lactate (3g) into water (180g).
- Add xanthan gum (1.5g) and blend until slightly thickened.
- Add food coloring and flavor drops for a bright sun-like appearance.
- Remove air bubbles.
- Pour into half-sphere silicone molds and freeze until solid in the blast freezer (1–2 hours).

Prepare the Sodium Alginate Bath

- Blend sodium alginate (2,5g) into distilled water (500g).
- Let sit for 12+ hours to remove air bubbles (ensures smooth gelation).

Spherification Using the Molded Core

- Unmold frozen calcium cores (they should hold their shape).
- Drop directly into the sodium alginate bath.
- Let them set for 2–3 minutes (longer if you want a thicker membrane).
- Remove carefully with a slotted spoon and rinse in clean water.

**4. The Clouds (Vanilla air)**

- If using vanilla extract, mix it directly into room-temperature water.
- Stir in 1g sugar/stevia (optional) to balance flavors.
- Sprinkle 2g soy lecithin evenly over the liquid.
- Let it hydrate for 2-3 minutes so it dissolves fully.
- Use an immersion blender at an angle (about 45°) just above the surface.
- Blend on high for 2-3 minutes until you see stable bubbles forming on top.
- If the foam is too thin, let it rest for 30 seconds before blending again.
- Use a spoon or fine strainer to carefully scoop the foam from the top.

**5. The Rocky Formations (Mango spheres)**

Prepare the Mango Base

- Mix 250g with 2.5g calcium lactate and 5g sugar gluconate and dissolve completely.
- Blend in 1g xanthan gum if you want a slightly thicker texture.
- Add mango flavor.
- Let it rest for 15–30 minutes to remove air bubbles.

Prepare the Alginate Bath

- Blend 2.5g sodium alginate into 500g deionized water using an immersion blender.
- Let it rest for 1–2 hours (or vacuum degas) to eliminate bubbles for a smooth bath.

Form the Spheres

- Using a spoon, gently drop the mango base into the alginate bath.
- Let them sit for 2–3 minutes.
- Remove carefully with a slotted spoon and rinse in clean water.
- Put on the freezer to preserve before coating.

Coat with Cocoa Butter Shell

- Gently melt 100g cocoa butter at 40–45°C.
- Mix in charcoal to achieve your desired stone color.
- Place the frozen mango spheres on a fork and dip quickly into the melted cocoa butter, then place on a cold plate or silicone mat.

**Results and discussion**

Finally, the complete dish was made within the time frame. I really liked how every element was developed in this kitchen session, I obtained the colors that I was expecting in each part. However, the way to structure and ensemble the dish was not the best. I need to work on the aesthetic side of the dish. On the other hand, I think that the dish is ready to present, and each element was completely obtained as I was expecting.

**Conclusion**

The dish is ready in terms of texture, colors and flavor, but it needs to improve its ensemble because it does not look appealing. Probably I need another way to

arrange each element, to improve how it looks. I was thinking of trying to center everything around the sun sphere, so it looks better.

**Recommendations for the following week**

In the case of how the dish is prepared it is complete, and I should keep the same process. The only thing that I need to work on is the presentation of the dish. Probably the sun should be in the center, and everything set around it to help to the aesthetics of the dish.